# 2008 Mathematics Specifications

# for the

# 2009-2010 Florida State Adoption

# of

# Instructional Materials

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# Florida's Vision for Mathematics Education

Research[i] indicates that mathematics learning is a strong indicator of success for post-secondary education and lifetime career earning potential. Research from Achieve, Incorporated also indicates that employers who offer jobs with benefits and sufficient salaries above the poverty level are requiring mathematics to the level of Algebra 2. While it is important for students to take high level mathematics courses, it is also important for students to understand mathematics concepts deeply. The number of Grade Level Expectations (benchmarks) in the 2007 Sunshine State Standards for math has been significantly reduced.

Florida intends to adopt instructional materials that reflect the philosophy of teaching mathematics concepts to more depth rather than with more breadth at each grade level, K-8. This means focusing on the Big Ideas and Supporting Ideas of that grade level, incorporating the use of content from prior grades, and not requiring or including content that has been postponed until future grade levels. This approach requires problem-solving, as defined by the National Council of Teachers of Mathematics, multiple representations of concepts, and involving the principles and standards for teaching and learning addressed in *the Principles and Standards for School Mathematics*.

## *Florida Is Committed to Adopting Comprehensive, Focused Mathematics Education Instructional Materials*

The 1996 content standards for mathematics were provided by grade bands (K-2, 3-5, 6-8, and 9-12) and were written to allow for broad interpretations of mathematical content by Florida school districts. The 2007 revised content standards[ii] for mathematics are written by grade-level for K-8 and are based on the National Council of Teachers of Mathematics' *Curriculum Focal Points*[iii]. Teaching these new standards may require teachers to allow more time for students to learn each concept or benchmark, and instructional materials will need to reflect the new emphasis on teaching a smaller number of mathematical concepts with a greater depth of understanding. Instructional materials should help teachers of mathematics move from concrete examples to the abstract thinking and provide multiple representations of the same concept so that students have multiple ways of constructing their own mathematical knowledge. The writers, framers, and reviewers of the Sunshine State Standards deliberately incorporated wording related to the National Council of Teachers of Mathematics (NCTM) Process Standards for teaching and learning into the benchmarks. For example, students are expected to use multiple representations and to explain and justify mathematical tasks. This is an important aspect of the 2007 Sunshine State Standards.

Florida requests publishers to submit challenging, motivating instructional materials based on the following characteristics:

- **Research-based**—Instructional materials incorporate specific strategies, teaching/instructional activities, procedures, examples, and opportunities for review and application consistent with current and confirmed research in mathematics education. Each publisher should carefully review the research basis for any program or strategy submitted for consideration. In particular, attention should be paid to the research that was conducted initially to develop the program as well as the research conducted *after* publication, such as program evaluations. It is important to determine if research supports the effectiveness of the program or approach with children having similar characteristics to those with whom it will be used. Submitted instructional materials should prioritize and sequence essential skills and strategies in a logical and coherent manner.

- **Aligned with Mathematics Content Standards**— All submitted mathematics curricula and instructional methods must reflect and support Florida's *Sunshine State Standards*[iv] addressing and reinforcing, whenever feasible, content area standards in other subject areas.

- **Alignment with Process Standards**-- Materials should align with and incorporate the National Council of Teachers of Mathematics' Process Standards.[v] These include the following processes:

  *Problem Solving* – Problem solving means engaging students in a task for which the solution method is not known in advance.

  *Representations* – Different representations may illuminate different aspects of concepts. Therefore, it is important that students work with multiple representations such as concrete materials, graphs, tables, words, and symbols whenever possible. For example, when learning about fractions, students may use circles, rectangles, concrete materials, number lines, drawings, or ratios of elements in a discrete set to represent the complex concept of fractions and build a rich mental model of the concept.

  *Reasoning and Proof* – Students at all levels should make, refine, test, and defend conjectures. Student reasoning is critical in problem solving, making connections between representations, and communication.

  *Connections* – Guiding students to make connections between different representations of concepts, mathematical topics (e.g., fraction multiplication may be connected with and built upon whole number multiplication), and other disciplines such as commerce, science, or art is a critical aspect for deepening student understanding and appreciation of mathematics. Mathematical ideas should be presented as connected and interdependent, rather than being presented and studied in isolation. Students' tasks should retain this quality.

*Communication* – Students may communicate mathematical ideas by speaking, drawing, writing, listening, and reading. Teachers and curriculum materials should help students make a transition between common language and mathematical language. Curriculum materials should encourage students to communicate in the manner described in the Reasoning and Proof section.

- **Balanced**—Instructional materials must strive to include an appropriate balance of skill development, conceptual understanding, and mathematical processes. Guidance for Balance may be provided by the National Research Council's five Strands of Mathematics Proficiency[vi]. The following areas should be addressed in a balanced fashion:

    1. Conceptual Understanding
    2. Procedural Fluency
    3. Strategic Competence
    4. Adaptive Reasoning
    5. Productive Disposition

- **Depth**—Instructional materials should maintain high expectations for all students. With a smaller number of benchmarks at each grade level, instructional materials should provide guidance for teachers and students to explore these concepts indepth, incorporating the five process standards and addressing all five strands of mathematics proficiency on each benchmark. The "fair-game principle" is important. This means that content from prior grades may be included in the current grade. For example, students are learning how to multiply and divide fractions in grade 6. This does not mean they do not add and subtract fractions in grade 6. Rather, students in grade 6 make choices whether to add, subtract, multiply or divide fractions, depending on the context of the problem.

- **Instructional Focus**—Instructional materials should foster the development of mathematics as a human endeavor and promote classroom discourse by explicitly requiring students to share their thinking and/or strategies. Where appropriate, lessons should involve the use of instructional technology, manipulatives, or other tools so that students can visualize complex concepts, analyze information, and communicate solutions. Useful diagrams, charts, data sets, and/or models should be provided to help students conceptualize mathematical concepts. Dynamic models of mathematical concepts are strongly encouraged.

- **Teacher Support**—Instructional materials should assist teachers in pedagogical knowledge. Instructional methods for engaging students in learning mathematics actively so that they take the ownership for their learning, key questions that teachers may ask students about a concept, ways to approach different ideas offered by students, and how to use student errors are examples of pedagogical support that instructional materials can provide for teachers. Assessment tools should be provided for assessing student learning and informing instructional decision making. Assessment tools should reflect a balance between conceptual understanding, procedural fluency, adaptive reasoning, and strategic competence. Materials should provide opportunities for teachers to increase their own understanding of the mathematical ideas that the students are learning and provide information about potential

misconceptions that students may have and should be addressed. Materials should provide a rich source of problems, exercises, and projects for reinforcing concepts introduced in class.

- **Assessment Component**—Publishers are required to include assessments that teachers can use to guide student instruction. Assessment tools should be provided for assessing student learning and informing instructional decision making. Materials should provide opportunities for teachers to increase their own understanding of the mathematical ideas that the students are learning and provide information about potential misconceptions that should be addressed. Materials should provide a rich source of problems, exercises, and projects for reinforcing concepts introduced in class. Assessment instruments and techniques should include elements of the Process Standards and should involve a balanced approach regarding the five strands of mathematics proficiency.

- **Professional Development**—Publishers will submit a Professional Development Plan for use with the submitted mathematics instructional materials. This plan must not incur additional cost. There must be initial professional development that provides adequate time for teachers to learn new concepts and practice what they learn. Teachers must also be instructed in the administration and interpretation of assessments that accompany the program. The professional development should be customized to meet the needs of teachers, principals, and mathematics coaches. There should also be a plan for coaches, mentors, peers, or outside experts to provide feedback to teachers and to follow up with assistance as they put new concepts into practice. After initial professional development, ongoing professional development must be offered to provide support and a deeper level of mathematics content knowledge. The PD should also provide support (e.g., principal checklists, follow up in class modeling, a CD for teachers to view model lessons) to facilitate application of content.

From **Selecting High-Quality Mathematics Textbooks**[vii]

## Guiding Principles for Mathematics Education

Chapter 2 of the *Principles and Standards for School Mathematics* (NCTM, 2000), is entitled "Principles for School Mathematics." Six principles are identified (page 11) as follows:

- Equity. Excellence in mathematics education requires equity—high expectations and strong support for all students.
- Curriculum. A curriculum is more than a collection of activities; it must be coherent, focused on important mathematics, and well articulated across the grades.
- Teaching. Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.
- Learning. Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.

- Assessment. Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
- Technology. Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

These six principles are so closely associated that it is impossible to separate them and their effects. An effective curriculum:

- focuses on important mathematics that students will use in life and in subsequent mathematics study;
- identifies the "big ideas" in mathematics;
- forms a coherent whole, aiming toward a particular goal in each lesson but fitting together across the year and from one year to another; and
- provides guidance regarding the scope and sequence of mathematics, the degree of attention that should be given to particular topics at particular times and when greater understanding of a topic is expected.

Curriculum should not be driven by instructional materials. However, quality instructional materials should aim toward these same goals and can be enormously helpful to students, teachers, parents, and administrators. Effective instructional materials help all students to learn mathematics, help all teachers to provide instruction and to continue to learn more about teaching, include an array of assessment approaches to yield feedback about learning and teaching, and incorporate technology into the teaching and learning.

## References


[i] Mulvenon, Denny, Stegman, et al http://normes.uark.edu/current_research/AERA04-Risk%20Factors_manuscript.pdf
[ii] http://www.floridastandards.org
[iii] http://www.nctm.org/standards/default.aspx?id=58
[iv] http://www.floridastandards.org
[v] http://standards.nctm.org/document/appendix/process.htm
[vi] http://www.nctm.org/uploadedFiles/Articles_and_Journals/TCM/Tying_It_All_Together.pdf
[vii] Tarr, Reys, Barker, and Billstein, "Selecting High-Quality Mathematics Textbooks," *Mathematics Teaching in the Middle School*, Vol 12, No 1, August 2006.

# Publishers' Submissions for Florida's 2009 –2010 Mathematics Adoption

Florida will accept for consideration bids for mathematics instructional materials configured as follows:

## K-5 Elementary Mathematics

- **Elementary Mathematics Series, K-5**

## Middle/Junior Mathematics Grades 6-8

- **1205010, 1205040, 1205070 - M/J Mathematics Series 1, 2, 3**
- **1205020, 1205050, 1205080 - M/J Mathematics Advanced Series 1, 2, 3**
- **1204000 - M/J Intensive Mathematics**

## High School Grades 9-12

- **1205500 - Explorations in Mathematics I**
- **1205510 - Explorations in Mathematics II**
- **1205370 - Consumer Math**
- **1205540 - Business Math**
- **1200300 - Pre-Algebra**
- **1200310 - Algebra I**
- **1200320 - Algebra I Honors**
- **1200370 - Algebra Ia and 1200380 - Algebra Ib (one text or two-text series)**
- **1207310, 1207320, 1207330 - Integrated Mathematics I, II, and III (series only)**
- **1205400, 1205410, 1205420 - Applied Mathematics I and II (series) OR I, II, III (series)**
- **1200330 - Algebra II**
- **1200340 - Algebra II Honors**
- **Advanced Algebra with Financial Applications**
- **1206310 - Geometry**
- **1206320 - Geometry Honors**
- **1206300 - Informal Geometry**
- **1208300 - Liberal Arts Mathematics**

- **1220910 - Discrete Mathematics**
- **1211300 - Trigonometry**
- **1206330 - Analytic Geometry**
- **1202340 - Pre-Calculus**
- **1201300 - Mathematical Analysis**
- **1201310 - Analysis of Functions**
- **1202300 - Calculus**
- **1202310 - Advanced Placement Calculus AB**
- **1202320 - Advanced Placement Calculus BC**
- **1210320 - Advanced Placement Statistics**
- **1210300 - Probability and Statistics with Applications**
- **1298310 - Advanced Topics in Mathematics**

# General Description for Publishers' Submissions

**Grades K – 8**

Based on the new mathematics content standards, the number of math concepts for grades K – 8 has been significantly reduced. The purpose behind this is to allow K – 8 teachers more time to teach specific, grade-level appropriate mathematical concepts in depth and for greater understanding rather than "covering" a wide range of concepts each year. With the previous Grade Level Expectations (GLEs), K – 8 math teachers had an average of 2 to 3 days per GLE. With the new math content standards, K – 8 teachers will have an average of 10 to 14 days per benchmark.

- The K – 8 benchmarks are built around 3 Big Ideas and 3 to 5 Supporting Ideas at each grade level. These provide a framework that allows the instructor to revisit over-arching concepts that the benchmarks will help students see a consistent, unifying theme in their learning of mathematics at a specific grade-level. *The benchmark codes and Big Idea or Supporting Idea numbers are not meant to imply order of instruction or order of importance.*
- All benchmarks are of equal importance.
- The power of the new K – 8 math content standards is to allow teachers in these grade levels to focus on the smaller number of mathematical concepts and teach them to greater understanding. **Instructional materials should reflect this focus and not include material that is beyond the scope of the concepts for a particular grade level.**
- Instructional materials that require students to use mathematical concepts or vocabulary earlier than stated are discouraged. **Inclusion of this type of material will decrease the evaluators' score of the instructional materials.**
- The math benchmarks in Grade 8 are intended to be a strong focus on pre-Algebra materials that will prepare 8th grade students who are not taking Algebra I to be fully prepared to successfully complete Algebra I in high school.

**Please note that Access Points are in draft and are expected to be approved at the State Board of Education meeting in June 2008.**

# Florida Perspective

**Florida's A++ Plan for Education and Highest Quality Instructional Materials**

The fundamental premise at the core of the state's education policy is unequivocal: every child can learn and no child should be left behind. The goal of Florida's A++ Plan for Education is to raise student achievement to world-class levels by reaffirming high standards, developing assessments, and ensuring accountability. Florida's reform effort is based on a commitment to continuous quality improvement in every school across the state. As such, it calls for improvement teams in schools to articulate a fundamentally new direction for instruction and to re-examine the ways in which the day-to-day business of schools is conducted.

Instructional Materials submitted for adoption in the State of Florida are correlated to Florida's Sunshine State Standards to ensure alignment to the state's assessment and accountability measurements. **The ultimate goal of Florida's Adoption Process is to provide the highest quality instructional materials to our teachers and students.**

**Florida's Continuous Improvement Model (FCIM)**

Improving student achievement and ensuring that our children receive a quality education are the top priorities of the State of Florida. Our goal is that each student will gain a year's worth of knowledge for every year enrolled in a Florida public school and that no student will be left behind. It is the intent of The Department of Education to provide the necessary resources to our schools so that these priorities will become a reality. The publishing industry, our partner in education, plays a vital role in this effort.
The following steps of Florida Continuous Improvement Model (FCIM) are being implemented in Florida's schools to maintain a continual view of student progress throughout the year.

- Disaggregate Students' Performance Data
- Develop Instructional Focus Calendar based on highest needs of students
- Deliver focused Benchmark Lessons aligned to the Sunshine State Standards
- Administer Mini-Assessments of Focus Benchmarks
- Provide Tutorials for Non-Mastery Students
- Provide Enrichments for Mastery Students
- Maintain Core of Knowledge
- Monitor Instructional Delivery and Efficacy of Process

Data Disaggregation

Florida's schools disaggregate and their student data by school, subject, classroom and individual student using a variety of available resources. Once the school has analyzed all available data and ranked state-assessed benchmark performance from weakest to strongest, an Instructional Focus Calendar is developed targeting the weakest benchmarks.

Focused Benchmark Lessons

In order for our schools to effectively implement the Instructional Focus Calendar, staff must have available high quality Focus Benchmark Lessons and Activities to target instruction on the identified weak benchmarks. Publishers submitting programs for adoption consideration are encouraged to develop Focus Benchmark Lessons as part of a comprehensive instructional program. Publishers are strongly encouraged to provide Correlation Charts that reflect locations and/or page numbers where specific Focus Benchmark Lessons and Activities can be found.

Mini-Assessments

Mini-Assessments are aligned to the Focus Benchmark Lessons. Mini-Assessments of three to five questions provide immediate feedback on student understanding and how to proceed with instruction. Ease of administration and use is essential. The Publisher's Correlation Charts should reflect locations and/or page numbers where specific Mini-Assessments can be found.

Tutorials

Publishers are encouraged to develop and include Tutorials for those students who show non-mastery of the Benchmarks based upon the Mini-Assessments. Research in quality instructional design clearly indicates that re-teaching methods must reflect differentiated approaches. If a student has not mastered content using prior delivery or teaching methods, then different strategies must be utilized. Publishers are encouraged to include research-based, effective and creative Tutorials for a variety of different learning styles and modalities. Again, each Publisher's Correlation Chart should reflect precise locations for access to Benchmark-based Tutorials.

Enrichments

Enrichment activities must be included for students who have mastered the benchmarks and require more challenging work. Just as Tutorials reflect an array of instructional strategies, Enrichments must address the needs of different learning styles and actively engage students in the learning process.

Maintenance

Maintenance activities, such as question(s) on a mini-assessment or connective lessons that loop back to previously taught Benchmarks, are critical in assuring that students retain information previously learned. Enrichment activities that include previously learned benchmarks may be a way that publishers can assist students with retaining what they have learned.

## Priorities for Reading in the Content Area

All instructional material programs submitted for adoption consideration must provide evidence of integration with other areas of instruction by supporting the notion that students in grades K-2 are learning to read, and that students in grades 3-12 are reading to learn. Throughout each of these grade levels, instructional materials should include vocabulary development, cognitive reasoning, and reading acquisition. Additionally, reading is a complex process and highly utilized across all content area assignments. Therefore, all submissions must integrate and carefully scaffold reading and literacy instruction to directly align with the corresponding text within each lesson. Reading and writing instruction and assignments must align with all content area instruction. Writing must also be integrated across the curriculum. This idea is aligned with the communication and connections process standards for mathematics.

## Universal Design for Curriculum Access

Because Florida will not have a separate call for special education students, publishers who submit material for consideration will be required to incorporate strategies, materials, activities, etc. that consider the special needs of these students. In providing for students with special needs, Florida evaluators will be guided by the research reported in the document *Universal Design for Curriculum Access*. The following Web sites can be accessed for detailed information on this research:

http://www.trace.wisc.edu/
http://www.cast.org

Although Florida is not having a separate call for Exceptional Student Education (ESE), that is not to say that all materials will be equally suitable for all children. Florida's State Adoption Committees may, as always, identify some submissions as "especially suitable" for a particular group of students. Some groups may be reading below grade level or above grade level, may include reluctant readers or students with disabilities. Committee comments appear with adopted titles in the Florida Catalog of Adopted Materials and serve as a guide for teachers and/or administrators in search of materials. Each State Adoption Committee has at least one member, though usually more than one, who is or has been a certified teacher of ESE students.

Accommodations and Modifications

The following summary of information from the Department of Education guide *Accommodations: Assisting Students with Disabilities* (2003) is of help in addressing the ways that materials may be developed or changed to meet the needs of students of varied abilities:

*Accommodations* are changes that can be made in HOW students learn. Accommodations are really "whatever it takes" to assure students with disabilities the opportunity to participate as fully as possible in the general curriculum and ultimately earn a diploma.

Accommodations:

- do not lessen achievement expectations.
- are a wide range of techniques and support systems that help students with disabilities work around any limitations that result from their disability.
  Examples include Braille textbooks or books on tape.
- may be needed by one student but frequently can benefit many or most students in a classroom.
- should be enabling, necessary, and used congruently for both instruction and assessment

Accommodations may be provided in five general areas:

- Instructional methods and materials
- Assignments and classroom assessments
- Time demands and scheduling
- Learning environment
- Use of special communication systems

Specific suggestions for accommodations in instructional materials and methods based on area of need are found in Chapter 3: What Can You Change.

*Modifications*, on the other hand, are changes that can be made to WHAT students are expected to learn. They are used primarily for students who cannot meet the Sunshine State Standards for their grade level and require a modified curriculum. Modifications change the goals and expectations for students.

Modifications may include:

- partial completion of program or course requirements
- curriculum expectations below age or grade level
- alternate assessment criteria
- alternate curricular goals

## Kindergarten

Big ideas for Kindergarten:

**BIG IDEA 1**: Represent, compare, and order whole numbers and join and separate sets.
**BIG IDEA 2**: Describe shapes and space.
**BIG IDEA 3:** Order objects by measurable attributes.

For each big idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| **BIG IDEA 1:** ***Represent, compare, and order whole numbers and join and separate sets.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.K.A.1.1 | Represent quantities with numbers up to 20, verbally, in writing, and with manipulatives. |
| MA.K.A.1.2 | Solve problems including those involving sets by counting, by using cardinal and ordinal numbers, by comparing, by ordering, and by creating sets up to 20. |
| MA.K.A.1.3 | Solve word problems involving simple joining and separating situations. |

| **Access Points for Students with Significant Cognitive Disabilities*** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.K.A.1.In.a Represent quantities to 5 using sets of objects and number names. (1.1) | MA.K.A.1.Su.a Represent quantities to 3 using sets of objects and number names. (1.1) | MA.K.A.1.Pa.a Indicate desire for more of a familiar action or object. (1.1) |
| MA.K.A.1.In.b Use one-to-one correspondence to count and compare sets of objects to 5. (1.2) | MA.K.A.1.Su.b Use one-to-one corre objects to 3. (1.2) | MA.K.A.1.Pa.b Indicate desire action or object. (1.1) |
| MA.K.A.1.In.c Solve problems with up to 5 objects, involving simple joining (putting together) and separating (taking away) situations. (1.3) | MA.K.A.1.Su.c Solve problems with up to 3 objects involving simple joining (putting together) situations. (1.3) | MA.K.A.1.Pa.c Solve problems involving small quantities of objects or actions using language, such as enough, too much, or more. (1.2, 1.3) |

| **BIG IDEA 2:** ***Describe shapes and space.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.K.G.2.1 | Describe, sort and re-sort objects using a variety of attributes such as shape, size, |

| | |
|---|---|
| | and position. |
| MA.K.G.2.2 | Identify, name, describe and sort basic two-dimensional shapes such as squares, triangles, circles, rectangles, hexagons, and trapezoids. |
| MA.K.G.2.3 | Identify, name, describe, and sort three-dimensional shapes such as spheres, cubes and cylinders. |
| MA.K.G.2.4 | Interpret the physical world with geometric shapes and describe it with corresponding vocabulary. |
| MA.K.G.2.5 | Use basic shapes, spatial reasoning, and manipulatives to model objects in the environment and to construct more complex shapes. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.K.G.2.In.a Sort objects by single attributes, including shape and size. (2.1)<br><br>MA.K.G.2.In.b Match and name two-dimensional shapes, including circle and square.(2.2)<br><br>MA.K.G.2.In.c Match examples of three-dimensional objects, such as balls (spheres) and blocks (cubes). (2.3)<br><br>MA.K.G.2.In.d Identify shapes, including circle and square, in the environment. (2.4)<br><br>MA.K.G.2.In.e Identify spatial relationships, including in, out, up, down, top, bottom, on, and off. (2.5) | MA.K.G.2.Su.a Sort common objects by size. (2.1)<br><br>MA.K.G.2.Su.b Identify square objects or pictures when given the name. (2.2)<br><br>MA.K.G.2.Su.c Identify three-dimensional objects, such as a block (cube) or ball (sphere). (2.3)<br><br>MA.K.G.2.Su.d Identify square shapes in the environment when given the name. (2.4)<br><br>MA.K.G.2.Su.e Identify spatial relationships, including on, off, up, and down. (2.5) | MA.K.G.2.Pa.a Recognize a familiar object with a two-dimensional shape. (2.1, 2.2, 2.4)<br><br>MA.K.G.2.Pa.b Recognize a familiar three-dimensional object. (2.1, 2.3, 2.4)<br><br>MA.K.G.2.Pa.c Recognize a movement that reflects a spatial relationship, such as up and down. (2.5) |

**BIG IDEA 3:** ***Order objects by measurable attributes.***

| **BENCHMARK CODE** | **BENCHMARK** |
|---|---|
| MA.K.G.3.1 | Compare and order objects indirectly or directly using measurable attributes such as length, height, and weight. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.K.G.3.In.a Compare overall size and length of objects and describe using terms such as big, small, long, and short. (3.1) | MA.K.G.3.Su.a Identify size of objects using terms, such as big and little. (3.1) | MA.K.G.3.Pa.a Recognize differences in size of objects. (3.1) |

Additionally, there are two supporting ideas for Kindergarten, one in Algebra and one in Geometry and Measurement.

For each supporting idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| SUPPORTING IDEAS | |
|---|---|
| **Algebra** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.K.A.4.1 | Identify and duplicate simple number and non-numeric repeating and growing patterns. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.K.A.4.In.a Match two-element repeating patterns of sounds, physical movements, and objects. (4.1) | MA.K.A.4.Su.a Match identical sounds, physical movements, and objects. (4.1) | MA.K.A.4.Pa.a Recognize two objects that are identical to each other. (4.1) |

| SUPPORTING IDEAS | | |
|---|---|---|
| **Geometry and Measurement** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.K.G.5.1 | Demonstrate an understanding of the concept of time using identifiers such as morning, afternoon, day, week, month, year, before/after, and shorter/longer. | |
| **Access Points for Students with Significant Cognitive Disabilities** | | |
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.K.G.5.In.a Identify concepts of time, including day, night, morning, and afternoon, by relating activities to a time period. (5.1) | MA.K.G.5.Su.a Identify concepts of time, including day and night, by relating daily events to a time period.(5.1) | MA.K.G.5.Pa.a Recognize common activities that occur every day. (5.1) |

## Grade 1

Big ideas for Grade 1:

**BIG IDEA 1:** Develop understandings of addition and subtraction strategies for basic addition facts and related subtraction facts.
**BIG IDEA 2:** Develop an understanding of whole number relationships, including grouping by tens and ones.
**BIG IDEA 3:** Compose and decompose two-dimensional and three-dimensional geometric shapes.

For each big idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| **BIG IDEA 1*: Develop understandings of addition and subtraction strategies for basic addition facts and related subtraction facts.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.1.A.1.1 | Model addition and subtraction situations using the concepts of “part-whole,” “adding to,” “taking away from,” “comparing,” and “missing addend.” |
| MA.1.A.1.2 | Identify, describe, and apply addition and subtraction as inverse operations. |
| MA.1.A.1.3 | Create and use increasingly sophisticated strategies, and use properties such as Commutative, Associative and Additive Identity, to add whole numbers. |

| | |
|---|---|
| MA.1.A.1.4 | Use counting strategies, number patterns, and models as a means for solving basic addition and subtraction fact problems. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.1.A.1.In.a Identify the meaning of addition as adding to and subtraction as taking away from. (1.1, 1.2)<br><br>MA.1.A.1.In.b Use counting and one-to-one correspondence as strategies to solve addition facts with sums to 10 and related subtraction facts represented by numerals with sets of objects and pictures. (1.3, 1.4) | MA.1.A.1.Su.a Demonstrate understanding of the meaning of joining (putting together) and separating (taking apart) sets of objects. (1.1, 1.2)<br><br>MA.1.A.1.Su.b Use one-to-one correspondence as a strategy for solving simple number stories involving joining (putting together) and separating (taking apart) with sets of objects to 5. (1.3, 1.4) | MA.1.A.1.Pa.a Recognize when an object or person is added to (addition) or is taken away from (subtraction) a situation. (1.1, 1.2)<br><br>MA.1.A.1.Pa.b Solve problems involving small quantities of objects or actions and language such as enough, too much, or more. (1.3, 1.4) |

**BIG IDEA 2:** ***Develop an understanding of whole number relationships, including grouping by tens and ones.***

| **BENCHMARK CODE** | **BENCHMARK** |
|---|---|
| MA.1.A.2.1 | Compare and order whole numbers at least to 100. |
| MA.1.A.2.2 | Represent two digit numbers in terms of tens and ones. |
| MA.1.A.2.3 | Order counting numbers, compare their relative magnitudes, and represent numbers on a number line. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.1.A.2.In.a Compare and order numbers 1 to 10. (2.1) | MA.1.A.2.Su.a Use one-to-one correspondence to compare sets of objects to 5. (2.1) | MA.1.A.2.Pa.a Associate quantities with language, such as many, a lot, or a little. (2.1, 2.2) |

| | | |
|---|---|---|
| MA.1.A.2.In.b Use one-to-one correspondence to count sets of objects or pictures to 10. (2.2)<br><br>MA.1.A.2.In.c Represent numbers to 10 using sets of objects and pictures, number names, and numerals. (2.3) | MA.1.A.2.Su.b Use one-to-one correspondence to count sets of objects to 5 arranged in a row. (2.2)<br><br>MA.1.A.2.Su.c Represent quantities to 5 using sets of objects and number names. (2.3) | MA.1.A.2.Pa.b Recognize rote counting 1 to 3. (2.3) |

| **BIG IDEA 3:** ***Compose and decompose two-dimensional and three-dimensional geometric shapes.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.1.G.3.1 | Use appropriate vocabulary to compare shapes according to attributes and properties such as number and lengths of sides, and number of vertices. |
| MA.1.G.3.2 | Compose and decompose plane and solid figures, including making predictions about them, to build an understanding of part-whole relationships and properties of shapes. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.1.G.3.In.a Sort and describe two-dimensional shapes by single attributes, such as number of sides and straight or round sides. (3.1)<br><br>MA.1.G.3.In.b Combine two shapes to make another shape and identify the whole-part relationship. (3.2) | MA.1.G.3.Su.a Match and name common two-dimensional objects by shape, including square and circle. (3.1)<br><br>MA.1.G.3.Su.b Sort common two- and three-dimensional objects by size, including big and little. (3.2) | MA.1.G.3.Pa.a Recognize common objects with two-dimensional shapes, such as circle or square. (3.1)<br><br>MA.1.G.3.Pa.b Recognize common three-dimensional objects, such as balls (spheres) or blocks (cubes). (3.2) |

Additionally, there are three supporting ideas for Grade 1, one in Algebra, one in Geometry and Measurement, and one in Number and Operations. For each supporting idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| SUPPORTING IDEAS | | |
|---|---|---|
| **Algebra** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.1.A.4.1 | Extend repeating and growing patterns, fill in missing terms, and justify reasoning. | |
| **Access Points for Students with Significant Cognitive Disabilities** | | |
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.1.A.4.In.a Match a two-element repeating visual pattern. (4.1) | MA.1.A.4.Su.a Match objects by single attributes, such as color, shape, or size. (4.1) | MA.1.A.4.Pa.a Recognize two objects that are the same size or color. (4.1) |
| **SUPPORTING IDEAS** | | |
| **Geometry and Measurement** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.1.G.5.1 | Measure by using iterations of a unit and count the unit measures by grouping units. | |
| MA.1.G.5.2 | Compare and order objects according to descriptors of length, weight and capacity. | |
| **Access Points for Students with Significant Cognitive Disabilities** | | |
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.1.G.5.In.a Measure length of objects using nonstandard units of measure and count the units. (5.1)<br><br>MA.1.G.5.In.b Compare objects by concepts of length—using terms, such as longer, shorter, and same—and capacity, using terms, such as full and empty. (5.2) | MA.1.G.5.Su.a Measure length of objects using nonstandard units of measure. (5.1)<br><br>MA.1.G.5.Su.b Compare objects by length using terms, such as long and short. (5.2) | MA.1.G.5.Pa.a Recognize similarities and differences in size of common objects. (5.1, 5.2) |
| **SUPPORTING IDEAS** | | |
| **Number and Operations** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.1.A.6.1 | Use mathematical reasoning and beginning understanding of tens and ones, including | |

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|---|---|
| | the use of invented strategies, to solve two-digit addition and subtraction problems |
| MA.1.A.6.2 | Solve routine and non-routine problems by acting them out, using manipulatives, and drawing diagrams |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.1.A.6.In.a Solve real-world problems involving addition facts with sums to 10 and related subtraction facts using numerals with sets of objects and pictures. (6.1, 6.2) | MA.1.A.6.Su.a Solve real-world problems involving simple joining (putting together) and separating (taking apart) situations with sets of objects to 5. (6.1, 6.2) | MA.1.A.6.Pa.a Solve simple problems involving putting together and taking apart small quantities of objects. (6.1, 6.2) |

## Grade 2

Big ideas for Grade 2:

**BIG IDEA 1:** Develop an understanding of base-ten numerations system and place-value concepts.
**BIG IDEA 2:** Develop quick recall of addition facts and related subtraction facts and fluency with multi-digit addition and subtraction.
**BIG IDEA 3:** Develop an understanding of linear measurement and facility in measuring lengths.

For each big idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| **BIG IDEA 1*: Develop an understanding of base-ten numerations system and place-value concepts.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.2.A.1.1 | Identify relationships between the digits and their place values through the thousands, including counting by tens and hundreds. |
| MA.2.A.1.2 | Identify and name numbers through thousands in terms of place value and apply this knowledge to expanded notation. |
| MA.2.A.1.3 | Compare and order multi-digit numbers through the thousands. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.2.A.1.In.a Apply the concept of grouping to create sets of tens and | MA.2.A.1.Su.a Use one-to-one correspondence to count, compare, | MA.2.A.1.Pa.a Match one ob |

| | | |
|---|---|---|
| ones to 20 as a strategy to aid in counting. (1.1)<br><br>MA.2.A.1.In.b Represent numbers to 20 using sets of objects and pictures, number names, and numerals. (1.2)<br><br>MA.2.A.1.In.c Identify and use ordinal numbers to fifth. (1.3)<br><br>MA.2.A.1.In.d Use one-to-one correspondence to count, compare, and order whole numbers 0 to 20. (1.3) | and order sets of objects to 5 or more. (1.1, 1.3)<br><br>MA.2.A.1.Su.b Represent quantities to 5 or more using sets of objects, number names, and numerals. (1.2) | show one-to-one corresponde<br><br>MA.2.A.2.Pa.b Associate quantities 1 and 2 with number names. (1.2) |

**BIG IDEA 2:** ***Develop quick recall of addition facts and related subtraction facts and fluency with multi-digit addition and subtraction.***

| BENCHMARK CODE | BENCHMARK |
|---|---|
| MA.2.A.2.1 | Recall basic addition and related subtraction facts. |
| MA.2.A.2.2 | Add and subtract multi-digit whole numbers through three digits with fluency by using a variety of strategies, including invented and standard algorithms and explanations of those procedures. |
| MA.2.A.2.3 | Estimate solutions to multi-digit addition and subtraction problems, through three digits. |
| MA.2.A.2.4 | Solve addition and subtraction problems that involve measurement and geometry. |

**Access Points for Students with Significant Cognitive Disabilities**

| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
|---|---|---|
| MA.2.A.2.In.a Identify the meaning of the +, -, and = signs in addition and subtraction problems. (2.1) | MA.2.A.2.Su.a Identify the meaning of addition as adding to and subtraction as taking away from, using sets of objects. (2.1) | MA.2.A.2.Pa.a Compare quantities to 3 using language, such as more, less, or the same. (2.1) |

| | | |
|---|---|---|
| MA.2.A.2.In.b Use counting and one-to-one correspondence as strategies to solve problems involving addition facts with sums to 10 and related subtraction facts using numerals with sets of pictures. (2.2, 2.3)<br><br>MA.2.A.2.In.c Solve real-world problems involving addition facts with sums to 10 and related subtraction facts, including measurement, geometry, and other problem situations. (2.4) | MA.2.A.2.Su.b Use counting and one-to-one correspondence as strategies to solve number stories involving addition facts with sums to 5 and related subtraction facts using sets of objects. (2.2, 2.3)<br><br>MA.2.A.2.Su.c Solve real-world problems involving addition facts with sums to 5 and related subtraction facts using sets of objects. (2.4) | MA.2.A.2.Pa.b Solve simple real-world problems involving joining or separating small quantities of objects. (2.2, 2.3, 2.4) |

**BIG IDEA 3:** ***Develop an understanding of linear measurement and facility in measuring lengths.***

| BENCHMARK CODE | BENCHMARK |
|---|---|
| MA.2.G.3.1 | Estimate and use standard units, including inches and centimeters, to partition and measure lengths of objects. |
| MA.2.G.3.2 | Describe the inverse relationship between the size of a unit and number of units needed to measure a given object. |
| MA.2.G.3.3 | Apply the Transitive Property when comparing lengths of objects. |
| MA.2.G.3.4 | Estimate, select an appropriate tool, measure, and/or compute lengths to solve problems. |

**Access Points for Students with Significant Cognitive Disabilities**

| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
|---|---|---|
| MA.2.G.3.In.a Use standard units of whole inches to measure the length of objects. (3.1, 3.2)<br><br>MA.2.G.3.In.b Compare and order objects of different lengths. (3.3)<br><br>MA.2.G.3.In.c Select and use a ruler to measure and compare lengths to solve problems. (3.4) | MA.2.G.3.Su.a Measure the length of objects using nonstandard units of measure and count to 5 or more units. (3.1, 3.2)<br><br>MA.2.G.3.Su.b Compare lengths of objects to solve real-world problems. (3.3, 3.4) | MA.2.G.3.Pa.a Recognize length of real objects, such as big, little, long, or short. (3.1, 3.2, 3.3, 3.4) |

Additionally, there are three supporting ideas for Grade 2, one in Algebra, one in Geometry and Measurement, and one in Number and Operations. For each supporting idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

<table>
<tr><th colspan="3">SUPPORTING IDEAS</th></tr>
<tr><th colspan="3">Algebra</th></tr>
<tr><th>BENCHMARK CODE</th><th colspan="2">BENCHMARK</th></tr>
<tr><td>MA.2.A.4.1</td><td colspan="2">Extend number patterns to build a foundation for understanding multiples and factors – for example, skip counting by 2’s, 5’s, 10’s.</td></tr>
<tr><td>MA.2.A.4.2</td><td colspan="2">Classify numbers as odd or even and explain why.</td></tr>
<tr><td>MA.2.A.4.3</td><td colspan="2">Generalize numeric and non-numeric patterns using words and tables.</td></tr>
<tr><td>MA.2.A.4.4</td><td colspan="2">Describe and apply equality to solve problems, such as in balancing situations.</td></tr>
<tr><td>MA.2.A.4.5</td><td colspan="2">Recognize and state rules for functions that use addition and subtraction.</td></tr>
<tr><th colspan="3">Access Points for Students with Significant Cognitive Disabilities</th></tr>
<tr><td>Independent:<br><br>MA.2.A.4.In.a Identify two-element repeating visual patterns and extend with one repetition. (4.1)<br><br>MA.2.A.4.In.b Fill in missing items in two-element repeating visual patterns. (4.3)<br><br>MA.2.A.4.In.c Identify equal and unequal sets of objects and pictures to 20. (4.4)<br><br>MA.2.A.4.In.d Recognize rules for addition functions, including 1 more and 2 more. (4.2, 4.5)</td><td>Supported:<br><br>MA.2.A.4.Su.a Match two-element repeating patterns of sounds, physical movements, and objects. (4.1, 4.3)<br><br>MA.2.A.4.Su.b Use one-to-one correspondence to identify sets of objects with the same number to 5. (4.4)<br><br>MA.2.A.4.Su.c Use the rule, 1 more, to identify the next number with numbers 1 to 5. (4.2, 4.5)</td><td>Participatory:<br><br>MA.2.A.4.Pa.a Recognize a such as sounds or lights. (4.1<br><br>MA.2.A.4.Pa.b Use one-to-one correspondence to identify sets of objects with the same amount to 2. (4.2, 4.4, 4.5)</td></tr>
</table>

| SUPPORTING IDEAS | |
|---|---|
| **Geometry and Measurement** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.2.G.5.1 | Use geometric models to demonstrate the relationships between wholes and their parts as a foundation to fractions. |
| MA.2.G.5.2 | Identify time to the nearest hour and half hour. |
| MA.2.G.5.3 | Identify, combine, and compare values of money in cents up to $1 and in dollars up to $100, working with a single unit of currency. |
| MA.2.G.5.4 | Measure weight/mass and capacity/volume of objects. Include the use of the appropriate unit of measure and their abbreviations including cups, pints, quarts, gallons, ounces (oz), pounds (lbs), grams (g), kilograms (kg), milliliters (mL) and liters (L). |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.2.G.5.In.a Match parts with the whole using geometric shapes. (5.1) | MA.2.G.5.Su.a Identify part and whole of geometric shapes. (5.1) | MA.2.G.5.Pa.a Recognize parts of common objects. (5.1) |
| MA.2.G.5.In.b Identify concepts of time, including before, after, yesterday, today, tomorrow, first, and next, by relating activities with the time period. (5.2) | MA.2.G.5.Su.b Identify the concepts of time, including morning, afternoon, before, after, and next, by relating activities with the time period. (5.2) | MA.2.G.5.Pa.b Recognize common activities that occur at regular times, such as lunch, bedtime, or going to school. (5.2) |
| MA.2.G.5.In.c Identify the days of the week in relation to the calendar. (5.2) | MA.2.G.5.Su.c Identify coins as money. (5.3) | MA.2.G.5.Pa.c Associate giving an action or object with receiving an action or object. (5.3) |
| MA.2.G.5.In.d Identify analog and digital clocks as tools for telling time. (5.2) | MA.2.G.5.Su.d Compare weight of objects using the concepts of heavy and light. (5.4) | MA.2.G.5.Pa.d Recognize differences in sizes of containers that hold liquids (capacity). (5.4) |
| MA.2.G.5.In.e Identify the purpose of coins and bills. (5.3) | | |

| | | |
|---|---|---|
| MA.2.G.5.In.f Compare objects by weight—using terms including heavy and light—and capacity, using terms including holds more and holds less. (5.4) | | |
| **SUPPORTING IDEAS** | | |
| **Number and Operations** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.2.A.6.1 | Solve problems that involve repeated addition. | |
| **Access Points for Students with Significant Cognitive Disabilities** | | |
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.2.A.6.In.a Solve problems involving addition of the same number such as 1+1 or 2+2 with sums to 10. (6.1) | MA.2.A.6.Su.a Solve problems involving combining sets with the same number of objects with sums to 4 using one-to-one correspondence and counting. (6.1) | MA.2.A.6.Pa.a Solve simple problems involving joining sets of objects with the same quantity to 2. (6.1) |

## Grade 3

Big ideas for Grade 3:

**BIG IDEA 1:** Develop understandings of multiplication and division and strategies for basic multiplication facts and related division facts.
**BIG IDEA 2:** Develop an understanding of fractions and fraction equivalence.
**BIG IDEA 3:** Describe and analyze properties of two-dimensional shapes.

For each big idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| **BIG IDEA 1:** ***Develop understandings of multiplication and division and strategies for basic multiplication facts and related division facts.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.3.A.1.1 | Model multiplication and division including problems presented in context: repeated addition, multiplicative comparison, array, how many combinations, |

| | |
|---|---|
| | measurement, and partitioning. |
| MA.3.A.1.2 | Solve multiplication and division fact problems by using strategies that result from applying number properties. |
| MA.3.A.1.3 | Identify, describe, and apply division and multiplication as inverse operations. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.A.1.In.a Solve problems that involve combining (multiplying) equal sets with quantities to 18 using objects and pictures with numerals. (1.1)<br><br>MA.3.A.1.In.b Solve addition facts with sums to 18 and related subtraction one-digit fact families using the formal algorithm with numerals and signs (+, -, =). (1.2)<br><br>MA.3.A.1.In.c Use one-to-one correspondence, grouping, and counting as strategies to solve real-world problems involving addition facts with sums to 18 and related subtraction facts. (1.2)<br><br>MA.3.A.1.In.d Use objects and pictures to represent the inverse relationship between addition and subtraction facts. (1.3) | MA.3.A.1.Su.a Solve problems that involve combining (multiplying) equal sets with sums to 9 using objects and pictures. (1.1)<br><br>MA.3.A.1.Su.b Solve addition facts with sums to 9 and related subtraction facts using numerals with objects and pictures. (1.1, 1.3)<br><br>MA.3.A.1.Su.c Use one-to-one correspondence and counting as strategies to solve real-world problems with addition facts with sums to 9 and related subtraction facts. (1.2) | MA.3.A.1.Pa.a Solve simple problems involving joining or separating sets of objects to 3. (1.1, 1.2)<br><br>MA.3.A.1.Pa.b Recognize when 1 or 2 items have been added to or removed from sets of objects to 3. (1.3) |

**BIG IDEA 2:** ***Develop an understanding of fractions and fraction equivalence.***

| BENCHMARK CODE | BENCHMARK |
|---|---|
| MA.3.A.2.1 | Represent fractions, including fractions greater than one, using area, set and linear models. |
| MA.3.A.2.2 | Describe how the size of the fractional part is related to the number of equal sized pieces in the whole. |
| MA.3.A.2.3 | Compare and order fractions, including fractions greater than one, using models and strategies. |
| MA.3.A.2.4 | Use models to represent equivalent fractions, including fractions greater than one, and identify representations of equivalence. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.A.2.In.a Represent half and whole using area and sets of objects. (2.1, 2.4)<br><br>MA.3.A.2.In.b Identify the relationship between half and whole. (2.2, 2.3) | MA.3.A.2.Su.a Recognize part and whole using area and sets of objects. (2.1, 2.2, 2.3, 2.4) | MA.3.A.2.Pa.a Recognize parts of whole objects and parts of sets of objects. (2.1, 2.2, 2.3, 2.4) |

| **BIG IDEA 3:** ***Describe and analyze properties of two-dimensional shapes.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.3.G.3.1 | Describe, analyze, compare and classify two-dimensional shapes using sides and angles – including acute, obtuse, and right angles – and connect these ideas to the definition of shapes. |
| MA.3.G.3.2 | Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides. |
| MA.3.G.3.3 | Build, draw and analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.G.3.In.a Identify attributes, including number of sides, curved or straight sides, and number of corners (angles), in two-dimensional shapes. (3.1)<br><br>MA.3.G.3.In.b Combine (compose) and separate (decompose) two-dimensional shapes to make other shapes. (3.2)<br><br>MA.3.G.3.In.c Identify two-dimensional shapes that are the same shape and size (congruent). (3.3) | MA.3.G.3.Su.a Sort two-dimensional shapes by single attributes, including numbers of sides and curved or straight sides. (3.1)<br><br>MA.3.G.3.Su.b Combine (compose) two shapes to make other shapes. (3.2)<br><br>MA.3.G.3.Su.c Match two-dimensional shapes that are the same shape and size (congruent). (3.3) | MA.3.G.3.Pa.a Recognize common objects with two-dimensional shapes, such as circle and square. (3.1, 3.2)<br><br>MA.3.G.3.Pa.b Recognize two-dimensional shapes, including circle and square, that are the same shape and size (congruent). (3.3) |

Additionally, there are four supporting ideas for Grade 3, one in Algebra, one in Geometry and Measurement, one in Number and Operations, and one in Data Analysis. For each supporting

idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| SUPPORTING IDEAS | | |
|---|---|---|
| **Algebra** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.3.A.4.1 | Create, analyze, and represent patterns and relationships using words, variables, tables and graphs. | |
| **Access Points for Students with Significant Cognitive Disabilities** | | |
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.A.4.In.a Complete growing visual and number patterns. (4.1) | MA.3.A.4.Su.a Match a two-element repeating visual pattern using objects and pictures. (4.1) | MA.3.A.4.Pa.a Recognize the next step in a simple pattern or sequence of activities. (4.1) |

| SUPPORTING IDEAS | | |
|---|---|---|
| **Geometry and Measurement** | | |
| **BENCHMARK CODE** | **BENCHMARK** | |
| MA.3.G.5.1 | Select appropriate units, strategies and tools to solve problems involving perimeter. | |
| MA.3.G.5.2 | Measure objects using fractional parts of linear units such as $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{10}$. | |
| MA.3.G.5.3 | Tell time to the nearest minute and to the nearest quarter hour, and determine the amount of time elapsed. | |
| **Access Points for Students with Significant Cognitive Disabilities** | | |
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.G.5.In.a Use a ruler to solve problems involving the length of sides of squares and rectangles. (5.1)<br><br>MA.3.G.5.In.b Identify half and | MA.3.G.5.Su.a Use nonstandard measurement units to solve problems for length of sides of squares. (5.1)<br><br>MA.3.G.5.Su.b Recognize part and | MA.3.G.5.Pa.a Recognize the sides of a square or rectangle. (5.1, 5.2)<br><br>MA.3.G.5.Pa.b Recognize part of day, such as morning |

| | | |
|---|---|---|
| whole of the length of objects. (5.2)<br><br>MA.3.G.5.In.c Identify time to hour and half hour using analog and digital clocks. (5.3)<br><br>MA.3.G.5.In.d Identify the months of the year in relation to calendars. (5.3) | whole of the length of objects. (5.2)<br><br>MA.3.G.5.Su.c Identify concepts of time, including yesterday, today, and tomorrow, by relating activities to the time period. (5.3)<br><br>MA.3.G.5.Su.d Identify the days of the week using a calendar. (5.3) | or afternoon, associated with an activity in one's own schedule. (5.3) |

| **SUPPORTING IDEAS** | |
|---|---|
| **Number and Operations** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.3.A.6.1 | Represent, compute, estimate and solve problems using numbers through hundred thousands. |
| MA.3.A.6.2 | Solve non-routine problems by making a table, chart, or list and searching for patterns. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.A.6.In.a Express, represent, and solve problems with cardinal numbers 0 to 30 and ordinal numbers to tenth using sets of objects or pictures, number names, and numerals. (6.1)<br><br>MA.3.A.6.In.b Apply the concepts of counting and grouping to create sets of tens and ones to identify the value of whole numbers to 30. (6,2) | MA.3.A.6.Su.a Express, represent, and solve problems with numbers to 10 using sets of objects and pictures, number names, and numerals. (6.1)<br><br>MA.3.A.6.Su.b Use one-to-one correspondence to count sets of objects to 10. (6.2) | MA.3.A.6.Pa.a Recognize quantities 1 to 3 using sets of objects, pictures, or number names. (6.1)<br><br>MA.3.A.6.Pa.b Match objects to designated spaces to show one-to-one correspondence for quantities 1 to 3. (6.2) |

| **SUPPORTING IDEAS** | |
|---|---|
| **Data Analysis** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.3.S.7.1 | Construct and analyze frequency tables, bar graphs, pictographs, and line plots from data, including data collected through observations, surveys, and experiments. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.3.S.7.In.a Sort and count objects and pictures into three designated (labeled) categories and display data in an object graph or pictograph. (7.1) | MA.3.S.7.Su.a Sort objects representing data into two designated (labeled) categories and count the number in each category. (7.1) | MA.3.S.7.Pa.a Identify items that belong together to form a set (data). (7.1) |

## Grade 4

Big ideas for Grade 4:

**BIG IDEA 1:** Develop quick recall of multiplication facts and related division facts and fluency with whole number multiplication.
**BIG IDEA 2:** Develop an understanding of decimals, including the connection between fractions and decimals.
**BIG IDEA 3:** Develop an understanding of area and determine the area of two-dimensional shapes.

For each big idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| **BIG IDEA 1*: Develop quick recall of multiplication facts and related division facts and fluency with whole number multiplication.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.4.A.1.1 | Use and describe various models for multiplication in problem-solving situations, and demonstrate recall of basic multiplication and related division facts with ease. |
| MA.4.A.1.2 | Multiply multi-digit whole numbers through four digits fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world problems. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.4.A.1.In.a Solve problems involving combining (multiplying) or separating into (dividing) equal sets with quantities to 30 using objects and pictures with numerals. (1.1) | MA.4.A.1.Su.a Solve problems that involve combining (multiplying) and separating (dividing) into equal sets with quantities to 15 using objects and pictures. (1.1) | MA.4.A.1.Pa.a Solve simple problems involving joining or separating sets of objects to 4. (1.1) |

| | | |
|---|---|---|
| MA.4.A.1.In.b Solve real-world addition and subtraction problems with two-digit numbers to 30 without regrouping, and check for accuracy. (1.2) | MA.4.A.1.Su.b Solve real-world problems involving addition facts with sums to 15 and related subtraction facts using numerals with sets of pictures and the +, -, and = signs. (1.2) | MA.4.A.1.Pa.b Recognize when items have been added to or removed from sets of objects to 4. (1.2) |

**BIG IDEA 2:** ***Develop an understanding of decimals, including the connection between fractions and decimals.***

| BENCHMARK CODE | BENCHMARK |
|---|---|
| MA.4.A.2.1 | Use decimals through the thousandths place to name numbers between whole numbers. |
| MA.4.A.2.2 | Describe decimals as an extension of the base-ten number system. |
| MA.4.A.2.3 | Relate equivalent fractions and decimals with and without models, including locations on a number line. |
| MA.4.A.2.4 | Compare and order decimals, and estimate fraction and decimal amounts in real-world problems. |

**Access Points for Students with Significant Cognitive Disabilities**

| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
|---|---|---|
| MA.4.A.2.In.a Apply the concepts of counting, grouping, and place value with whole numbers to create sets of tens and ones to identify the value of whole numbers to 50. (2.1, 2.2)<br><br>MA.4.A.2.In.b Express and represent fractions, including halves and fourths, as parts of a whole and parts of a set using objects, pictures, and number names. (2.3)<br><br>MA.4.A.2.In.c Identify differences between halves, fourths, and a whole. (2.4) | MA.4.A.2.Su.a Apply the concept of grouping to create sets of tens and ones to 18 as a strategy for counting objects. (2.1, 2.2)<br><br>MA.4.A.2.Su.b Represent half and whole using area and sets of objects. (2.3)<br><br>MA.4.A.2.Su.c Identify half as a part of a whole. (2.4) | MA.4.A.2.Pa.a Match objects to designated spaces to show one-to-one correspondence for quantities 1 to 4. (2.1, 2.2)<br><br>MA.4.A.2.Pa.b Distinguish parts of objects from whole objects. (2.3)<br><br>MA.4.A.2.Pa.c Recognize a half of an object as part of the whole object. (2.4) |

| **BIG IDEA 3:** ***Develop an understanding of area and determine the area of two-dimensional shapes.*** | |
|---|---|
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.4.G.3.1 | Describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area. |
| MA.4.G.3.2 | Justify the formula for the area of the rectangle "area = base x height." |
| MA.4.G.3.3 | Select and use appropriate units, both customary and metric, strategies, and measuring tools to estimate and solve real-world area problems. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.4.G.3.In.a Identify the distance around all sides (perimeter) and area of squares and rectangles in the environment. (3.1)<br><br>MA.4.G.3.In.b Find the length of the sides and the area of rectangular and square objects using square units. (3.2)<br><br>MA.4.G.3.In.c Measure whole inches and feet using a ruler to solve real-world linear measurement problems. (3.3) | MA.4.G.3.Su.a Identify examples of the concept of area in the environment. (3.1)<br><br>MA.4.G.3.Su.b Count the number of square units of a rectangle marked with a grid to determine its area. (3.2)<br><br>MA.4.G.3.Su.c Measure length of sides of rectangles using whole inches. (3.3) | MA.4.G.3.Pa.a Identify the sides of a square or rectangle. (3.1, 3.2)<br><br>MA.4.G.3.Pa.b Recognize differences in the length of the sides of rectangles. (3.3) |

Additionally, there are three supporting ideas for Grade 4, one in Algebra, one in Geometry and Measurement, and one in Number and Operations. For each supporting idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| SUPPORTING IDEAS | | | |
|---|---|---|---|
| **Algebra** | | | |
| **BENCHMARK CODE** | **BENCHMARK** | | |
| MA.4.A.4.1 | Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns. | | |
| MA.4.A.4.2 | Describe mathematics relationships using expressions, equations, and visual representations. | | |
| MA.4.A.4.3 | Recognize and write algebraic expressions for functions with two operations. | | |
| **Access Points for Students with Significant Cognitive Disabilities** | | | |
| ***Independent:*** | | ***Supported:*** | ***Participatory:*** |
| MA.4.A.4.In.a Identify and extend growing visual and number patterns using strategies, such as skip counting. (4.1)<br><br>MA.4.A.4.In.b Describe equal and unequal sets using terms including greater than, less than, and equal to. (4.2)<br><br>MA.4.A.4.In.c Identify the rule, including 1 less, 2 less, and 3 less, represented in number pairs. (4.3) | | MA.4.A.4.Su.a Identify and copy two-element repeating visual patterns using objects and pictures. (4.1)<br><br>MA.4.A.4.Su.b Determine if the number in two sets of objects to 10 is the same or different (equal or unequal). (4.2)<br><br>MA.4.A.4.Su.c Use the rule, 1 more, to identify the next number with numbers 1 to 20. (4.3) | MA.4.A.4.Pa.a Identify the next step in a pattern or sequence of activities. (4.1)<br><br>MA.4.A.4.Pa.b Use one-to-one correspondence to compare sets of objects to 4 and determine if they are the same or different (equal or unequal). (4.2)<br><br>MA.4.A.4.Pa.c Recognize the quantity of a set of objects to 3 and add 1 more. (4.3) |

| SUPPORTING IDEAS | |
|---|---|
| **Geometry and Measurement** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.4.G.5.1 | Classify angles of two-dimensional shapes using benchmark angles (i.e. 45˚, 90˚, 180˚, and 360˚). |
| MA.4.G.5.2 | Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry. |

| | |
|---|---|
| MA.4.G.5.3 | Identify and build a three-dimensional object from a two-dimensional representation of that object and vice versa. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.4.G.5.In.a Locate angles in two-dimensional shapes, including triangles and rectangles. (5.1)<br><br>MA.4.G.5.In.b Identify examples of two-dimensional figures that are the same shape and size (congruency) and figures that are visually the same on both sides of a central dividing line (symmetry) in the environment. (5.2)<br><br>MA.4.G.5.In.c Sort three-dimensional objects, such as cubes, cylinders, cones, rectangular prisms, and spheres. (5.3) | MA.4.G.5.Su.a Locate angles within a triangle. (5.1)<br><br>MA.4.G.5.Su.b Identify two-dimensional figures that are visually the same on both sides of a central dividing line (symmetry). (5.2)<br><br>MA.4.G.5.Su.c Match three-dimensional objects with models, such as a cube, cylinder, cone, and sphere. (5.3) | MA.4.G.5.Pa.a Recognize corners (angles) in common objects with two-dimensional shapes, such as a square or rectangle. (5.1)<br><br>MA.4.G.5.Pa.b Recognize the two sides of a two-dimensional figure created by a central dividing line (symmetry) (5.2)<br><br>MA.4.G.5.Pa.c Recognize three-dimensional objects, such as ball (sphere), block (cube), or tube (cylinder). (5.3) |

**SUPPORTING IDEAS**

**Number and Operations**

| **BENCHMARK CODE** | **BENCHMARK** |
|---|---|
| MA.4.A.6.1 | Use and represent numbers through millions in various contexts, including estimation of relative sizes of amounts or distances. |
| MA.4.A.6.2 | Use models to represent division as:<br>• the inverse of multiplication<br>• as partitioning<br>• as successive subtraction |
| MA.4.A.6.3 | Generate equivalent fractions and simplify fractions. |
| MA.4.A.6.4 | Determine factors and multiples for specified whole numbers. |

| | |
|---|---|
| MA.4.A.6.5 | Relate halves, fourths, tenths, and hundredths to decimals and percents. |
| MA.4.A.6.6 | Estimate and describe reasonableness of estimates; determine the appropriateness of an estimate versus an exact answer. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.4.A.6.In.a Express, represent, and use whole numbers 0 to 50 in various contexts. (6.1)<br><br>MA.4.A.6.In.b Use the inverse relationship of addition and subtraction as a strategy to solve problems. (6.2)<br><br>MA.4.A.6.In.c Identify the relationship between halves, fourths, and a whole. (6.3, 6.5)<br><br>MA.4.A.6.In.d Use skip counting by 5s and 10s to determine amounts to 50. (6.4)<br><br>MA.4.A.6.In.e Use strategies such as comparing and grouping to estimate quantities to 20. (6.6) | MA.4.A.6.Su.a Express, represent, and use whole numbers to 25 using sets of objects and pictures, number names, and numerals in various contexts. (6.1)<br><br>MA.4.A.6.Su.b Use ordinal numbers, including first and second, in real-world situations. (6.1)<br><br>MA.4.A.6.Su.c Use objects and pictures to represent the relationship between addition with sums to 15 and related subtraction facts. (6.2)<br><br>MA.4.A.6.Su.d Identify the relationship between half and whole. (6.3, 6.5)<br><br>MA.4.A.6.Su.e Separate quantities to 25 into equal sets and identify the total number of sets and the number in each set. (6.4)<br><br>MA.4.A.6.Su.f Use strategies such as comparing and grouping to estimate quantities to 10. (6.6) | MA.4.A.6.Pa.a Use quantities to 4 represented by objects, pictures, or number names in various contexts. (6.1, 6.6)<br><br>MA.4.A.6.Pa.b Separate groups of objects to 4 into sets with the same quantity. (6.2, 6.4)<br><br>MA.4.A.6.Pa.c Match parts to whole objects. (6.3, 6.5) |

## Grade 5

Big ideas for Grade 5:

**BIG IDEA 1:** Develop an understanding of and fluency with division of whole numbers.
**BIG IDEA 2:** Develop an understanding of and fluency with addition and subtraction of fractions and decimals.
**BIG IDEA 3:** Describe three-dimensional shapes and analyze their properties, including volume and surface area.

For each big idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

<table>
<tr><th colspan="3">BIG IDEA 1: Develop an understanding of and fluency with division of whole numbers.</th></tr>
<tr><th>BENCHMARK CODE</th><th colspan="2">BENCHMARK</th></tr>
<tr><td>MA.5.A.1.1</td><td colspan="2">Describe the process of finding quotients involving multi-digit dividends using models, place value, properties and the relationship of division to multiplication.</td></tr>
<tr><td>MA.5.A.1.2</td><td colspan="2">Estimate quotients or calculate them mentally depending on the context and numbers involved.</td></tr>
<tr><td>MA.5.A.1.3</td><td colspan="2">Interpret solutions to division situations including those with remainders depending on the context of the problem.</td></tr>
<tr><td>MA.5.A.1.4</td><td colspan="2">Divide multi-digit whole numbers fluently, including solving real-world problems, demonstrating understanding of the standard algorithm and checking the reasonableness of results.</td></tr>
<tr><th colspan="3">Access Points for Students with Significant Cognitive Disabilities</th></tr>
<tr><th>Independent:</th><th>Supported:</th><th>Participatory:</th></tr>
<tr><td>MA.5.A.1.In.a Use a grouping strategy to separate (divide) quantities to 50 into equal sets using objects, coins, and pictures with numerals. (1.1, 1.3, 1.4)</td><td>MA.5.A.1.Su.a Use counting and grouping to separate (divide) quantities to 25 into equal sets using objects and pictures with numerals. (1.1, 1.3, 1.4)</td><td>MA.5.A.1.Pa.a Separate groups of objects to 4 into sets with the same quantity and recognize how many are in each set. (1.1, 1.3, 1.4)</td></tr>
</table>

| | | |
|---|---|---|
| MA.5.A.1.In.b Solve problems that involve multiplying or dividing equal sets with quantities to 50 using objects and pictures with numerals. (1.2) | MA.5.A.1.Su.b Solve problems that involve combining (multiplying) or separating (dividing) equal sets with quantities to 25 using objects and pictures with numerals. (1.2) | MA.5.A.1.Pa.b Solve simple problems involving joining or separating sets of objects to 5. (1.2) |

**BIG IDEA 2:** ***Develop an understanding of and fluency with addition and subtraction of fractions and decimals.***

| BENCHMARK CODE | BENCHMARK |
|---|---|
| MA.5.A.2.1 | Represent addition and subtraction of decimals and fractions with like and unlike denominators using models, place value or properties. |
| MA.5.A.2.2 | Add and subtract fractions and decimals fluently and verify the reasonableness of results, including in problem situations. |
| MA.5.A.2.3 | Make reasonable estimates of fraction and decimal sums and differences, and use techniques for rounding. |
| MA.5.A.2.4 | Determine the prime factorization of numbers. |

**Access Points for Students with Significant Cognitive Disabilities**

| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
|---|---|---|
| MA.5.A.2.In.a Express, represent, and use fractions—including halves, fourths, and thirds—as parts of a whole and as parts of a set, using number names. (2.1)<br><br>MA.5.A.2.In.b Compare fractional parts of objects of equal size, including halves, fourths, and thirds. (2.3, 2.4) | MA.5.A.2.Su.a Express, represent, and use fractions—including halves and fourths—as parts of a whole and as parts of a set, using number names. (2.1)<br><br>MA.5.A.2.Su.b Compare fractional parts of objects of equal size, including halves and fourths. (2.3, 2.4) | MA.5.A.2.Pa.a. Identify parts of a whole using a set of objects or a whole object. (2.1, 2.4)<br><br>MA.5.A.2.Pa.b Distinguish half from whole using objects or visual models. (2.2) |

| | | |
|---|---|---|
| MA.5.A.2.In.c Express, represent, and use whole numbers to 100 in various contexts. (2.2)<br><br>MA.5.A.2.In.d Identify place value of two-digit numbers to 99 in terms of tens and ones. (2.3) | MA.5.A.2.Su.c Express, represent, and use whole numbers to 30 and ordinal numbers first to fifth in various contexts. (2.2)<br><br>MA.5.A.2.Su.d Apply the concepts of counting and grouping by tens and ones to identify the value of whole numbers to 30. (2.3) | MA.5.A.2.Pa.c Compare sets of objects to 5 and determine if they have same or different quantities. (2.3) |

**BIG IDEA 3:** ***Describe three-dimensional shapes and analyze their properties, including volume and surface area.***

| BENCHMARK CODE | BENCHMARK |
|---|---|
| MA.5.G.3.1 | Analyze and compare the properties of two-dimensional figures and three-dimensional solids (polyhedra), including the number of edges, faces, vertices, and types of faces. |
| MA.5.G.3.2 | Describe, define and determine surface area and volume of prisms by using appropriate units and selecting strategies and tools. |

**Access Points for Students with Significant Cognitive Disabilities**

| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
|---|---|---|
| MA.5.G.3.In.a Identify properties, including number of edges, curved or straight sides, and faces; and match two-dimensional shapes with three-dimensional solids, including circle with sphere, square with cube, and triangle with cone. (3.1)<br><br>MA.5.G.3.In.b Identify the six faces of a three-dimensional rectangular prism or cube using a real object or physical model. (3.2) | MA.5.G.3.Su.a Identify properties, including number of edges, curved or straight sides, and number of corners (angles), in two- and three-dimensional figures. (3.1)<br><br>MA.5.G.3.Su.b Recognize the faces of a three-dimensional solid. (3.2) | MA.5.G.3.Pa.a Recognize differences in features related to the shape of two- and three-dimensional objects. (3.1)<br><br>MA.5.G.3.Pa.b Recognize differences in size of two- and three-dimensional objects. (3.2) |

Additionally, there are four supporting ideas for Grade 5, one in Algebra, one in Geometry and Measurement, one in Number and Operations, and one in Data Analysis. For each supporting idea, there are several benchmarks and access points for students with significant cognitive disabilities, provided below:

| SUPPORTING IDEAS | |
|---|---|
| **Algebra** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.5.A.4.1 | Use the properties of equality to solve numerical and real world situations. |
| MA.5.A.4.2 | Construct and describe a graph showing continuous data, such as a graph of a quantity that changes over time. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.5.A.4.In.a Use the concept of equality as a strategy to solve problems. (4.1)<br><br>MA.5.A.4.In.b Describe the meaning of information in a pictograph or bar graph that shows change over time. (4.2) | MA.5.A.4.Su.a Identify and compare the relationship between two same or different (equal or unequal) sets to 25 using physical and visual models. (4.1)<br><br>MA.5.A.4.Su.b Identify information displayed on an object graph or pictograph. (4.2) | MA.5.A.4.Pa.a Identify items that belong together to form two sets with the same quantity (equal). (4.1)<br><br>MA.5.A.4.Pa.b Recognize an object graph or pictograph. (4.2). |

| SUPPORTING IDEAS | |
|---|---|
| **Geometry and Measurement** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.5.G.5.1 | Identify and plot ordered pairs on the first quadrant of the coordinate plane. |
| MA.5.G.5.2 | Compare, contrast, and convert units of measure within the same dimension (length, mass, or time) to solve problems. |
| MA.5.G.5.3 | Solve problems requiring attention to approximation, selection of appropriate measuring tools, and precision of measurement. |
| MA.5.G.5.4 | Derive and apply formulas for areas of parallelograms, triangles, and trapezoids from the area of a rectangle. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.5.G.5.In.a Indicate the relative position, before or after, of whole numbers on a 0 to 100 number line. (5.1)<br><br>MA.5.G.5.In.b Solve real-world problems involving length and weight using tools with standard units. (5.2, 5.3)<br><br>MA.5.G.5.In.c Identify time to the minute. (5.2)<br><br>MA.5.G.5.In.d Find the area of rectangles and squares using a visual model, such as a grid. (5.4) | MA.5.G.5.Su.a Indicate the relative position, before or after, of whole numbers on a 1 to 10 number line. (5.1)<br><br>MA.5.G.5.Su.b Solve real-world problems by using tools and comparing measurement, including length and weight. (5.2, 5.3)<br><br>MA.5.G.5.Su.c Identify time to the hour and half-hour. (5.2)<br><br>MA.5.G.5.Su.d Identify the distance around all sides (perimeter) of squares and rectangles. (5.4)<br><br>MA.5.G.5.Su.e Compare the size of two square areas using physical models. (5.4) | MA.5.G.5.Pa.a Count from 1 to 5 using objects or pictures. (5.1)<br><br>MA.5.G.5.Pa.b Identify differences in features of objects, such as shape and size, to solve simple problems. (5.2, 5.3)<br><br>MA.5.G.5.Pa.c Indicate the next regularly occurring activity in the daily schedule. (5.2)<br><br>MA.5.G.5.Pa.d Recognize differences in size of large and small areas. (5.4) |

| SUPPORTING IDEAS | |
|---|---|
| **Number and Operations** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.5.A.6.1 | Identify and relate prime and composite numbers, factors and multiples within the context of fractions. |
| MA.5.A.6.2 | Use the order of operations to simplify expressions which include exponents and parentheses. |
| MA.5.A.6.3 | Describe real-world situations using positive and negative numbers. |
| MA.5.A.6.4 | Compare, order, and graph integers, including integers shown on a number line. |
| MA.5.A.6.5 | Solve non-routine problems using various strategies including “solving a simpler problem” and “guess, check, and revise.” |

| *Access Points for Students with Significant Cognitive Disabilities* | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.5.A.6.In.a Use skip counting to identify multiples of 2, 5, and 10 for numbers to 100. (6.1)<br><br>MA.5.A.6.In.b Use the associative property as a strategy to solve addition problems with three or more numbers. (6.2)<br><br>MA.5.A.6.In.c Compare and order numbers to 100 using a number line. (6.3, 6.4)<br><br>MA.5.A.6.In.d Solve real-world addition and subtraction problems with one-digit numbers by estimating and checking for accuracy. (6.5)<br><br>MA.5.A.6.In.e Select the operation and solve one-step problems involving addition or subtraction of two-digit numbers without regrouping and check for accuracy. (6.5)<br><br>MA.5.A.6.In.f Solve for an unknown number in addition and subtraction number sentences with numbers to 18. (6.5)<br><br>. | MA.5.A.6.Su.a Use skip counting by 5s to 30. (6.1)<br><br>MA.5.A.6.Su.b Use the commutative property as a strategy to check the accuracy of solutions to addition problems. (6.2)<br><br>MA.5.A.6.Su.c Compare and order whole numbers to 30 using objects, pictures, number names, numerals, and a number line. (6.3, 6.4)<br><br>MA.5.A.6.Su.d Solve real-world problems involving addition facts with sums to 25 and related subtraction facts using numerals with pictures. (6.5) | MA.5.A.6.Pa.a Demonstrate one-to-one correspondence to count from 1 to 5 using objects or pictures. (6.1)<br><br>MA.5.A.6.Pa.b Recognize when items have been added to or taken away from sets of objects to 5. (6.2)<br><br>MA.5.A.6.Pa.c Solve simple problems involving small quantities using language, such as more, less, and same. (6.3, 6.4, 6.5) |

| **SUPPORTING IDEAS** | |
|---|---|
| **Data Analysis** | |
| **BENCHMARK CODE** | **BENCHMARK** |
| MA.5.S.7.1 | Construct and analyze line graphs and double bar graphs. |
| MA.5.S.7.2 | Differentiate between continuous and discrete data and determine ways to represent those using graphs and diagrams. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.5.S.7.In.a Sort and count data into three designated categories, and display data on a pictograph or bar graph. (7.1)<br><br>MA.5.S.7.In.b Describe the meaning of data in a three-category pictograph or bar graph. (7.2) | MA.5.S.7.Su.a Sort and count objects or pictures into two designated categories and display data in an object graph or pictograph. (7.1)<br><br>MA.5.S.7.Su.b Identify the meaning of data in a two-category object graph or pictograph. (7.2) | MA.5.S.7.Pa.a Count up to 5 objects, pictures, or symbols in data sets used in object graphs or pictographs. (7.1, 7.2) |

# Grades 6 - 8

For Grades 6 – 8 (Middle/Junior High), students can take regular courses (M/J Mathematics 1, M/J Mathematics 2, and M/J Mathematics 3) or an advanced sequence (M/J Mathematics 1 Advanced, M/J Mathematics 2 Advanced, M/J Mathematics 3 Advanced). The M/J Mathematics 1 Advanced and M/J Mathematics 2 Advanced are designed to prepare a student to take Algebra 1 or Algebra 1 Honors in grade 8. The M/J Mathematics 3 Advanced is designed for a student who is prepared for some Algebra 1 concepts in grade 8.

## Grade 6 (M/J Mathematics 1)

Big ideas for Grade 6:

**BIG IDEA 1:** Develop an understanding of and fluency with multiplication and division of fractions and decimals.
**BIG IDEA 2:** Connect ratio and rates to multiplication and division.
**BIG IDEA 3:** Write, interpret, and use mathematical expressions and equations.

| | |
|---|---|
| **Course Code** | 1205010 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | M/J Mathematics 1 - 6th Regular |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | NA |
| **Abbreviated Title** | M/J Mathematics 1 - 6th Regular |

**RELATED BENCHMARKS (21) :**

| Scheme | Descriptor |
|---|---|
| LA.6.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.6.4.2.2 | The student will record information (e.g., observations, notes, lists, charts, legends) related to a topic, including visual aids to organize and record information and include a list of sources used; |
| MA.6.A.1.1 | Explain and justify procedures for multiplying and dividing fractions and decimals. |
| MA.6.A.1.2 | Multiply and divide fractions and decimals efficiently. |
| MA.6.A.1.3 | Solve real-world problems involving multiplication and division of fractions and decimals. |
| MA.6.A.2.1 | Use reasoning about multiplication and division to solve ratio and rate problems. |
| MA.6.A.2.2 | Interpret and compare ratios and rates. |
| MA.6.A.3.1 | Write and evaluate mathematical expressions that correspond to given situations. |
| MA.6.A.3.2 | Write, solve, and graph one- and two- step linear equations and inequalities. |
| MA.6.A.3.3 | Works backward with two-step function rules to undo expressions. |
| MA.6.A.3.4 | Solve problems given a formula. |
| MA.6.A.3.5 | Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent. |
| MA.6.A.3.6 | Construct and analyze tables, graphs and equations to describe linear functions and other simple relationships, including a discussion of slope as the rate of change without the use of the slope formula relations using both common language and algebraic notation. |
| MA.6.A.5.1 | Use equivalent forms of fractions, decimals, and percents to solve problems. |
| MA.6.A.5.2 | Compare and order fractions, decimals, and percents, including finding their approximate location on a number line. |
| MA.6.A.5.3 | Estimate the results of computations with fractions, decimals, and percents and judge the reasonableness of the results. |
| MA.6.G.4.1 | Understand the concept of p, know common estimates of p (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles. |
| MA.6.G.4.2 | Find the perimeters and areas of composite 2-Dimensional figures, including non-rectangular figures (such as semicircles) using various strategies. |
| MA.6.G.4.3 | Determine a missing dimension of a plane figure or prism, given its area or volume and some of the dimensions, or determine the area or volume given the dimensions. |
| MA.6.S.6.1 | Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data. |
| MA.6.S.6.2 | Select and analyze the measures of central tendency or variability to represent, describe, analyze and/or summarize a data set for the purposes of answering questions appropriately. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.6.A.1.In.a Express and represent fractions, including halves, fourths, thirds, and eighths, using number names and numerals. (1.1)<br><br>MA.6.A.1.In.b Identify multiplication as repeated addition of equal groups and multiply one-digit numbers using physical and visual models with numerals. (1.2)<br><br>MA.6.A.1.In.c Identify division as repeated subtraction of equal groups and divide one-digit numbers using physical and visual models with numerals. (1.2)<br><br>MA.6.A.1.In.d Solve real-world problems involving fractions, including halves, fourths, thirds, and eighths. (1.3) | MA.6.A.1.Su.a Express, represent, and use fractions including halves, fourths, and thirds, as parts of a whole and as parts of a set using number names. (1.1)<br><br>MA.6.A.1.Su.b Combine (multiply) equal sets with quantities to 30 using objects and pictures with numerals. (1.2)<br><br>MA.6.A.1.Su.c Use counting and grouping to separate (divide) quantities to 30 into sets with the same number using objects or pictures. (1.2)<br><br>MA.6.A.1.Su.d Solve real-world problems involving fractions, including halves, fourths, and thirds using real objects or visual or physical models. (1.3) | MA.6.A.1.Pa.a Recognize part (half) of sets of objects to 4. (1.1, 1.2)<br><br>MA.6.A.1.Pa.b Solve simple problems involving joining and separating parts of a set or parts of a whole. (1.3) |
| MA.6.A.2.In.a Identify the meaning of common uses of ratio, such as equivalent fractions and mixtures. (2.1)<br><br>MA.6.A.2.In.b Identify two meanings of rate: a measure of speed, including miles per hour and words per minute; and a measure of cost, including price per gallon and cost per pound. (2.2) | MA.6.A.2.Su.a Recognize the meaning of a simple ratio, such as 2 to 1. (2.1)<br><br>MA.6.A.2.Su.b Identify one meaning of rate, including how fast something moves or happens. (2.2) | MA.6.A.2.Pa.a Recognize differences in quantity in two sets of objects to 6. (2.1)<br><br>MA.6.A.2.Pa.b Recognize changes in rates of movement (fast and slow). (2.2) |

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|---|---|---|
| MA.6.A.3.In.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with two-digit numbers. (3.1)<br><br>MA.6.A.3.In.b Use models and diagrams to solve problems with inequalities, including the > and < signs. (3.2)<br><br>MA.6.A.3.In.c Identify function rules with addition and subtraction of one-digit numbers represented in number pairs, such as +5, - 4, or +3. (3.3)<br><br>MA.6.A.3.In.d Use the Commutative and Associative Properties of addition to show that two number sentences (equations) are equal. (3.5)<br><br>MA.6.A.3.In.e Solve addition and subtraction number sentences (equations) using information from physical models, diagrams, and tables. (3.4, 3.6) | MA.6.A.3.Su.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit numbers. (3.1)<br><br>MA.6.A.3.Su.b Use physical models and diagrams to solve problems with inequalities, including the terms more than and less than. (3.2)<br><br>MA.6.A.3.Su.c Identify function rules of 1 more and 1 less represented in number pairs, such as 5 is 1 more than 4 and 3 is 1 less than 4. (3.3)<br><br>MA.6.A.3.Su.d Use the Commutative Property of addition to show that two number sentences represented by physical and visual models are equal. (3.5)<br><br>MA.6.A.3.Su.e Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit numbers. (3.4, 3.6) | MA.6.A.3.Pa.a Solve simple problems involving small quantities using language, such as more, less, same, and none. (3.1, 3.2, 3.6)<br><br>MA.6.A.3.Pa.b Identify quantity in sets of objects to 6 and add 1 more. (3.3, 3.4)<br><br>MA.6.A.3.Pa.c Determine if the quantity in two sets of objects to 6 is the same or different. (3.5, 3.6) |
| MA.6.G.4.In.a Compare the distance around the outside of circles (circumference) and areas using physical or visual models. (4.1)<br><br>MA.6.G.4.In.b Measure the distance around all sides (perimeter) of polygons, such as squares, triangles, rectangles, and hexagons and compare the areas using physical or visual models. (4.2, 4.3)<br><br>MA.6.G.4.In.c Measure capacity using cups, pints, quarts, and gallons. (4.3) | MA.6.G.4.Su.a Identify the distance around the outside of circles (circumference) and compare areas of circles using physical models. (4.1)<br><br>MA.6.G.4.Su.b Measure the lengths of sides of rectangles and triangles and compare the areas of rectangular and square shapes using physical models. (4.2, 4.3)<br><br>MA.6.G.4.Su.c Measure capacity using cups. (4.3) | MA.6.G.4.Pa.a Recognize the outside (circumference) and inside (area) of a circle. (4.1)<br><br>MA.6.G.4.Pa.b Recognize the outside (perimeter) and inside (area) of rectangles and triangles (4.2, 4.3) |

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|---|---|---|
| MA.6.A.5.In.a Express, represent, and use whole numbers to 200 in various contexts. (5.1)<br><br>MA.6.A.5.In.b Identify the value of money to $2.00 expressed as a decimal. (5.1)<br><br>MA.6.A.5.In.c Compare fractional parts of the same size objects or sets, including halves, fourths, thirds, and eighths. (5.2)<br><br>MA.6.A.5.In.d Solve two-step real-world problems involving addition and subtraction of two-digit numbers and check for accuracy using the reverse operation. (5.3)<br><br>MA.6.A.5.In.e Use a grouping strategy or place value to round to the nearest ten to determine a reasonable estimate in problem situations involving whole numbers to 100, and check for accuracy. (5.3) | MA.6.A.5.Su.a Express, represent, and use whole numbers to 50 using objects, pictures, number names, and numerals, in various contexts. (5.1)<br><br>MA.6.A.5.Su.b Identify the value of coins to $.50 expressed as a decimal. (5.1)<br><br>MA.6.A.5.Su.c Compare and order whole numbers to 50 using objects, pictures, number names, and numerals. (5.2)<br><br>MA.6.A.5.Su.d Solve real-world problems involving addition and subtraction with sums to 50 using strategies such as representing and grouping objects or tallies. (5.3)<br><br>MA.6.A.5.Su.e Apply the concepts of counting and grouping to identify the value of whole numbers to 50. (5.3) | MA.6.A.5.Pa.a Match two or more sets of objects to 6 using one-to-one correspondence. (5.1)<br><br>MA.6.A.5.Pa.b Compare the size of parts of objects to the whole to determine which is the largest or smallest. (5.2)<br><br>MA.6.A.5.Pa.c Solve simple problems involving joining or separating sets of objects to 6. (5.3) |
| MA.6.S.6.In.a Identify the categories with the largest and smallest numbers represented on a bar graph. (6.1, 6.2) | MA.6.S.6.Su.a Identify the category with the largest number in a pictograph representing real-world situations. (6.1, 6.2) | MA.6.S.6.Pa.a Identify the largest set of objects, pictures, or symbols to 6 representing data in an object graph or pictograph. (6.1, 6.2) |

## Grade 6 (M/J Mathematics 1 Advanced)

Big ideas for Grade 6:

**BIG IDEA 1:** Develop an understanding of and fluency with multiplication and division of fractions and decimals.
**BIG IDEA 2:** Connect ratio and rates to multiplication and division.
**BIG IDEA 3:** Write, interpret, and use mathematical expressions and equations.

Additionally, Big Idea 3 from 7th grade is included in this course:

**BIG IDEA 3:** Develop an understanding of operations on all rational numbers and solving linear equations.

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|---|---|
| **Course Code** | 1205020 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | M/J Mathematics: 1 Advanced - 6th Advanced |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | NA |
| **Abbreviated Title** | M/J Mathematics: 1 Advanced - 6th Advanced |

**RELATED BENCHMARKS (31) :**

| Scheme | Descriptor |
|---|---|
| LA.6.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.6.4.2.2 | The student will record information (e.g., observations, notes, lists, charts, legends) related to a topic, including visual aids to organize and record information and include a list of sources used; |
| MA.6.A.1.1 | Explain and justify procedures for multiplying and dividing fractions and decimals. |
| MA.6.A.1.2 | Multiply and divide fractions and decimals efficiently. |
| MA.6.A.1.3 | Solve real-world problems involving multiplication and division of fractions and decimals. |
| MA.6.A.2.1 | Use reasoning about multiplication and division to solve ratio and rate problems. |
| MA.6.A.2.2 | Interpret and compare ratios and rates. |
| MA.6.A.3.1 | Write and evaluate mathematical expressions that correspond to given situations. |
| MA.6.A.3.2 | Write, solve, and graph one- and two- step linear equations and inequalities. |
| MA.6.A.3.3 | Works backward with two-step function rules to undo expressions. |
| MA.6.A.3.4 | Solve problems given a formula. |
| MA.6.A.3.5 | Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent. |
| MA.6.A.3.6 | Construct and analyze tables, graphs and equations to describe linear functions and other simple relationships, including a discussion of slope as the rate of change without the use of the slope formula relations using both common language and algebraic notation. |
| MA.6.A.5.1 | Use equivalent forms of fractions, decimals, and percents to solve problems. |
| MA.6.A.5.2 | Compare and order fractions, decimals, and percents, including finding their approximate location on a number line. |
| MA.6.A.5.3 | Estimate the results of computations with fractions, decimals, and percents and judge the reasonableness of the results. |
| MA.6.G.4.1 | Understand the concept of p, know common estimates of p (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles. |
| MA.6.G.4.2 | Find the perimeters and areas of composite 2-Dimensional figures, including non-rectangular figures (such as semicircles) using various strategies. |
| MA.6.G.4.3 | Determine a missing dimension of a plane figure or prism, given its area or volume and some of the dimensions, or determine the area or volume given the dimensions. |
| MA.6.S.6.1 | Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data. |

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|---|---|
| MA.6.S.6.2 | Select and analyze the measures of central tendency or variability to represent, describe, analyze and/or summarize a data set for the purposes of answering questions appropriately. |
| MA.7.A.1.2 | Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease. |
| MA.7.A.3.1 | Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers. |
| MA.7.A.3.2 | Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts. |
| MA.7.A.3.3 | Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients. |
| MA.7.A.3.4 | Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context. |
| MA.7.A.5.1 | Express rational numbers as terminating or repeating decimals. |
| MA.7.A.5.2 | Solve non-routine problems by working backwards. |
| MA.7.G.2.1 | Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones. |
| MA.7.G.2.2 | Use formulas to find surface areas and volume of three-dimensional composite shapes. |
| MA.7.G.4.3 | Identify and plot ordered pairs in all four quadrants of the coordinate plane. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.6.A.1.In.a Express and represent fractions, including halves, fourths, thirds, and eighths, using number names and numerals. (1.1)<br><br>MA.6.A.1.In.b Identify multiplication as repeated addition of equal groups and multiply one-digit numbers using physical and visual models with numerals. (1.2) | MA.6.A.1.Su.a Express, represent, and use fractions including halves, fourths, and thirds, as parts of a whole and as parts of a set using number names. (1.1)<br><br>MA.6.A.1.Su.b Combine (multiply) equal sets with quantities to 30 using objects and pictures with numerals. (1.2) | MA.6.A.1.Pa.a Recognize part (half) of sets of objects to 4. (1.1, 1.2)<br><br>MA.6.A.1.Pa.b Solve simple problems involving joining and separating parts of a set or parts of a whole. (1.3) |

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|---|---|---|
| MA.6.A.1.In.c Identify division as repeated subtraction of equal groups and divide one-digit numbers using physical and visual models with numerals. (1.2)<br><br>MA.6.A.1.In.d Solve real-world problems involving fractions, including halves, fourths, thirds, and eighths. (1.3) | MA.6.A.1.Su.c Use counting and grouping to separate (divide) quantities to 30 into sets with the same number using objects or pictures. (1.2)<br><br>MA.6.A.1.Su.d Solve real-world problems involving fractions, including halves, fourths, and thirds using real objects or visual or physical models. (1.3) | |
| MA.6.A.2.In.a Identify the meaning of common uses of ratio, such as equivalent fractions and mixtures. (2.1)<br><br>MA.6.A.2.In.b Identify two meanings of rate: a measure of speed, including miles per hour and words per minute; and a measure of cost, including price per gallon and cost per pound. (2.2)<br><br>MA.6.A.3.In.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with two-digit numbers. (3.1)<br><br>MA.6.A.3.In.b Use models and diagrams to solve problems with inequalities, including the > and < signs. (3.2)<br><br>MA.6.A.3.In.c Identify function rules with addition and subtraction of one-digit numbers represented in number pairs, such as +5, - 4, or +3. (3.3) | MA.6.A.2.Su.a Recognize the meaning of a simple ratio, such as 2 to 1. (2.1)<br><br>MA.6.A.2.Su.b Identify one meaning of rate, including how fast something moves or happens. (2.2)<br><br>MA.6.A.3.Su.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit numbers. (3.1)<br><br>MA.6.A.3.Su.b Use physical models and diagrams to solve problems with inequalities, including the terms more than and less than. (3.2)<br><br>MA.6.A.3.Su.c Identify function rules of 1 more and 1 less represented in number pairs, such as 5 is 1 more than 4 and 3 is 1 less than 4. (3.3) | MA.6.A.2.Pa.a Recognize differences in quantity in two sets of objects to 6. (2.1)<br><br>MA.6.A.2.Pa.b Recognize changes in rates of movement (fast and slow). (2.2)<br><br>MA.6.A.3.Pa.a Solve simple problems involving small quantities using language, such as more, less, same, and none. (3.1, 3.2, 3.6)<br><br>MA.6.A.3.Pa.b Identify quantity in sets of objects to 6 and add 1 more. (3.3, 3.4)<br><br>MA.6.A.3.Pa.c Determine if the quantity in two sets of objects to 6 is the same or different. (3.5, 3.6) |

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| MA.6.A.3.In.d Use the Commutative and Associative Properties of addition to show that two number sentences (equations) are equal. (3.5)<br><br>MA.6.A.3.In.e Solve addition and subtraction number sentences (equations) using information from physical models, diagrams, and tables. (3.4, 3.6) | MA.6.A.3.Su.d Use the Commutative Property of addition to show that two number sentences represented by physical and visual models are equal. (3.5)<br><br>MA.6.A.3.Su.e Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit numbers. (3.4, 3.6) | |
| MA.6.G.4.In.a Compare the distance around the outside of circles (circumference) and areas using physical or visual models. (4.1)<br><br>MA.6.G.4.In.b Measure the distance around all sides (perimeter) of polygons, such as squares, triangles, rectangles, and hexagons and compare the areas using physical or visual models. (4.2, 4.3)<br><br>MA.6.G.4.In.c Measure capacity using cups, pints, quarts, and gallons. (4.3)<br><br>MA.6.A.5.In.a Express, represent, and use whole numbers to 200 in various contexts. (5.1)<br><br>MA.6.A.5.In.b Identify the value of money to $2.00 expressed as a decimal. (5.1)<br><br>MA.6.A.5.In.c Compare fractional parts of the same size objects or sets, including halves, fourths, thirds, and eighths. (5.2) | MA.6.G.4.Su.a Identify the distance around the outside of circles (circumference) and compare areas of circles using physical models. (4.1)<br><br>MA.6.G.4.Su.b Measure the lengths of sides of rectangles and triangles and compare the areas of rectangular and square shapes using physical models. (4.2, 4.3)<br><br>MA.6.G.4.Su.c Measure capacity using cups. (4.3)<br><br>MA.6.A.5.Su.a Express, represent, and use whole numbers to 50 using objects, pictures, number names, and numerals, in various contexts. (5.1)<br><br>MA.6.A.5.Su.b Identify the value of coins to $.50 expressed as a decimal. (5.1) | MA.6.G.4.Pa.a Recognize the outside (circumference) and inside (area) of a circle. (4.1)<br><br>MA.6.G.4.Pa.b Recognize the outside (perimeter) and inside (area) of rectangles and triangles (4.2, 4.3)<br><br>MA.6.A.5.Pa.a Match two or more sets of objects to 6 using one-to-one correspondence. (5.1)<br><br>MA.6.A.5.Pa.b Compare the size of parts of objects to the whole to determine which is the largest or smallest. (5.2)<br><br>MA.6.A.5.Pa.c Solve simple problems involving joining or separating sets of objects to 6. (5.3) |

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|---|---|---|
| MA.6.A.5.In.d Solve two-step real-world problems involving addition and subtraction of two-digit numbers and check for accuracy using the reverse operation. (5.3)<br><br>MA.6.A.5.In.e Use a grouping strategy or place value to round to the nearest ten to determine a reasonable estimate in problem situations involving whole numbers to 100, and check for accuracy. (5.3) | MA.6.A.5.Su.c Compare and order whole numbers to 50 using objects, pictures, number names, and numerals. (5.2)<br><br>MA.6.A.5.Su.d Solve real-world problems involving addition and subtraction with sums to 50 using strategies such as representing and grouping objects or tallies. (5.3)<br><br>MA.6.A.5.Su.e Apply the concepts of counting and grouping to identify the value of whole numbers to 50. (5.3) | |
| MA.6.S.6.In.a Identify the categories with the largest and smallest numbers represented on a bar graph. (6.1, 6.2) | MA.6.S.6.Su.a Identify the category with the largest number in a pictograph representing real-world situations. (6.1, 6.2) | MA.6.S.6.Pa.a Identify the largest set of objects, pictures, or symbols to 6 representing data in an object graph or pictograph. (6.1, 6.2) |
| MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems. (1.2) | MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations. (1.2) | MA.7.A.1.Pa.b Match objects to a model or picture that is a smaller version. (1.2, 1.3, 1.4, 1.5, 1.6) |
| MA.7.G.2.In.a Identify properties of three-dimensional figures, including pyramid, prism, and cylinder. (2.1)<br><br>MA.7.G.2.In.b Use stated formulas to solve for perimeter and area of rectangles. (2.2) | MA.7.G.2.Su.a Identify three-dimensional figures, including cone, pyramid, prism, and cylinder. (2.1)<br><br>MA.7.G.2.Su.b Add lengths of sides of rectangles to determine the distance around (perimeter) and find the area using square units. (2.2) | MA.7.G.2.Pa.a Recognize common three-dimensional figures, such as sphere, cube, cylinder, or cone. (2.1)<br><br>MA.7.G.2.Pa.b Match common three-dimensional figures that are the same size. (2.2) |

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| MA.7.A.3.In.a Solve number sentences (equations) involving addition and subtraction of numbers to 500. (3.1, 3.2)<br><br>MA.7.A.3.In.b Solve number sentences involving multiplication and division facts. (3.1, 3.2)<br><br>MA.7.A.3.In.c Translate real-world problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers using a problem solving strategy. (3.3)<br><br>MA.7.A.3.In.d Use the property of equality as a strategy to solve real-world problems. (3.4) | MA.7.A.3.Su.a Add and subtract one-digit and two-digit number sentences (equations). (3.1, 3.2)<br><br>MA.7.A.3.Su.b Solve problems that involve combining (multiplying) or separating (dividing) equal sets with quantities to 50 using objects and pictures with numerals. (3.1, 3.2)<br><br>MA.7.A.3.Su.c Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit and two-digit numbers. (3.3)<br><br>MA.7.A.3.Su.d Use physical models to solve simple problems to demonstrate the concept of equality. (3.4) | MA.7.A.3.Pa.a Solve simple problems involving joining or separating sets of objects to 7. (3.1, 3.2)<br><br>MA.7.A.3.Pa.b Solve simple problems involving small quantities using language, such as more, less, same, larger, smaller, and none. (3.3, 3.4) |
| MA.7.G.4.In.c Identify common uses of a coordinate plane, such as a map or line graph. (4.3) | MA.7.G.4.Su.c Recognize a common use of a coordinate plane, such as a map. (4.3) | MA.7.G.4.Pa.c Solve problems using directional or positional language, such as up, down, left, right, and next to. (4.3) |
| MA.7.A.5.In.a Express, represent, and use percents, including 50% and 100%, and decimals in the context of money to $5.00 or more. (5.1)<br><br>MA.7.A.5.In.b Solve problems using a grouping strategy or place value to round whole numbers to 500 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy. (5.2) | MA.7.A.5.Su.a Identify the value of money to $1.00 written as a decimal. (5.1)<br><br>MA.7.A.5.Su.b Solve problems by counting and grouping to create sets of tens and ones to identify the value of whole numbers to 100. (5.2) | MA.7.A.5.Pa.a Express and use quantities 1 to 7 using objects, pictures, symbols, or number names. (5.1)<br><br>MA.7.A.5.Pa.b Solve problems by joining or separating sets of objects or pictures with quantities to 7. (5.2) |

## Grade 7 (M/J Mathematics 2)

Big ideas for Grade 7:

**BIG IDEA 1:** Develop an understanding of and apply proportionality, including similarity.
**BIG IDEA 2:** Develop an understanding of and use formulas to determine surface areas and volumes of three-dimensional shapes.
**BIG IDEA 3:** Develop an understanding of operations on all rational numbers and solving linear equations.

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|---|---|
| **Course Code** | 1205040 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | M/J Mathematics 2 - 7th Regular |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | NA |
| **Abbreviated Title** | M/J Mathematics 2 - 7th Regular |

**RELATED BENCHMARKS (24) :**

| Scheme | Descriptor |
|---|---|
| LA.7.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.7.3.2.2 | The student will draft writing by organizing information into a logical sequence and combining or deleting sentences to enhance clarity; and |
| MA.7.A.1.1 | Distinguish between situations that are proportional or not proportional and use proportions to solve problems. |
| MA.7.A.1.2 | Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease. |
| MA.7.A.1.3 | Solve problems involving similar figures. |
| MA.7.A.1.4 | Graph proportional relationships and identify the unit rate as the slope of the related linear function. |
| MA.7.A.1.5 | Distinguish direct variation from other relationships, including inverse variation. |
| MA.7.A.1.6 | Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed. |
| MA.7.A.3.1 | Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers. |
| MA.7.A.3.2 | Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts. |
| MA.7.A.3.3 | Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients. |
| MA.7.A.3.4 | Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context. |

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| MA.7.A.5.1 | Express rational numbers as terminating or repeating decimals. |
| MA.7.A.5.2 | Solve non-routine problems by working backwards. |
| MA.7.G.2.1 | Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones. |
| MA.7.G.2.2 | Use formulas to find surface areas and volume of three-dimensional composite shapes. |
| MA.7.G.4.1 | Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and apply these relationships to solve problems. |
| MA.7.G.4.2 | Predict the results of transformations and draw transformed figures, with and without the coordinate plane. |
| MA.7.G.4.3 | Identify and plot ordered pairs in all four quadrants of the coordinate plane. |
| MA.7.G.4.4 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems. |
| MA.7.P.7.1 | Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair. |
| MA.7.P.7.2 | Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events, |
| MA.7.S.6.1 | Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population. |
| MA.7.S.6.2 | Construct and analyze histograms, stem-and-leaf plots, and circle graphs. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.7.A.1.In.a Solve real-world problems involving simple ratios, such as 2 to 1 or 1 to 3, using physical models, graphic representations, and charts. (1.1)<br><br>MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems. (1.2)<br><br>MA.7.A.1.In.c Measure and describe how various kinds of models compare in size to real-life objects. (1.3, 1.4, 1.5, 1.6) | MA.7.A.1.Su.a Solve real-world problems involving simple ratios, such as 2 to 1, using objects or pictures. (1.1)<br><br>MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations. (1.2)<br><br>MA.7.A.1.Su.c Compare the size of models to real-life objects using language, such as same, larger, and smaller. (1.3, 1.4, 1.5, 1.6) | MA.7.A.1.Pa.a Solve a simple problem involving a 2 to 1 ratio using objects. (1.1)<br><br>MA.7.A.1.Pa.b Match objects to a model or picture that is a smaller version. (1.2, 1.3, 1.4, 1.5, 1.6) |

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| MA.7.G.2.In.a Identify properties of three-dimensional figures, including pyramid, prism, and cylinder. (2.1)<br><br>MA.7.G.2.In.b Use stated formulas to solve for perimeter and area of rectangles. (2.2) | MA.7.G.2.Su.a Identify three-dimensional figures, including cone, pyramid, prism, and cylinder. (2.1)<br><br>MA.7.G.2.Su.b Add lengths of sides of rectangles to determine the distance around (perimeter) and find the area using square units. (2.2) | MA.7.G.2.Pa.a Recognize common three-dimensional figures, such as sphere, cube, cylinder, or cone. (2.1)<br><br>MA.7.G.2.Pa.b Match common three-dimensional figures that are the same size. (2.2) |
| MA.7.A.3.In.a Solve number sentences (equations) involving addition and subtraction of numbers to 500. (3.1, 3.2)<br><br>MA.7.A.3.In.b Solve number sentences involving multiplication and division facts. (3.1, 3.2)<br><br>MA.7.A.3.In.c Translate real-world problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers using a problem solving strategy. (3.3)<br><br>MA.7.A.3.In.d Use the property of equality as a strategy to solve real-world problems. (3.4) | MA.7.A.3.Su.a Add and subtract one-digit and two-digit number sentences (equations). (3.1, 3.2)<br><br>MA.7.A.3.Su.b Solve problems that involve combining (multiplying) or separating (dividing) equal sets with quantities to 50 using objects and pictures with numerals. (3.1, 3.2)<br><br>MA.7.A.3.Su.c Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit and two-digit numbers. (3.3)<br><br>MA.7.A.3.Su.d Use physical models to solve simple problems to demonstrate the concept of equality. (3.4) | MA.7.A.3.Pa.a Solve simple problems involving joining or separating sets of objects to 7. (3.1, 3.2)<br><br>MA.7.A.3.Pa.b Solve simple problems involving small quantities using language, such as more, less, same, larger, smaller, and none. (3.3, 3.4) |
| MA.7.G.4.In.a Identify the effects of changes in the lengths of sides of rectangles on the perimeter and area using physical and visual models. (4.1)<br><br>MA.7.G.4.In.b Identify examples of slides (translations), turns (rotations), and flips (reflections) of geometric figures using pictures and objects. (4.2) | MA.7.G.4.Su.a Recognize that changes in the lengths of sides of rectangles will make the figure or object smaller or larger. (4.1)<br><br>MA.7.G.4.Su.b Match identical (congruent) geometric figures in different positions, including flips (reflections) and turns (rotations). (4.2) | MA.7.G.4.Pa.a Match two- and three-dimensional objects with the same shape but different size. (4.1)<br><br>MA.7.G.4.Pa.b Recognize objects that have been turned (rotated). (4.2)<br><br>MA.7.G.4.Pa.c Solve problems using directional or positional language, such as up, down, left, right, and next to. (4.3) |

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| MA.7.G.4.In.c Identify common uses of a coordinate plane, such as a map or line graph. (4.3)<br><br>MA.7.G.4.In.d Use tools, such as charts and technology, to convert measures of capacity, including cups, pints, quarts, and gallons. (4.4) | MA.7.G.4.Su.c Recognize a common use of a coordinate plane, such as a map. (4.3)<br><br>MA.7.G.4.Su.d Use tools, such as a chart, to identify the number of cups in a pint and quart to convert measures of capacity. (4.4) | MA.7.G.4.Pa.d Identify similarities and differences in features of objects, such as shape and size. (4.4) |
| MA.7.A.5.In.a Express, represent, and use percents, including 50% and 100%, and decimals in the context of money to $5.00 or more. (5.1)<br><br>MA.7.A.5.In.b Solve problems using a grouping strategy or place value to round whole numbers to 500 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy. (5.2) | MA.7.A.5.Su.a Identify the value of money to $1.00 written as a decimal. (5.1)<br><br>MA.7.A.5.Su.b Solve problems by counting and grouping to create sets of tens and ones to identify the value of whole numbers to 100. (5.2) | MA.7.A.5.Pa.a Express and use quantities 1 to 7 using objects, pictures, symbols, or number names. (5.1)<br><br>MA.7.A.5.Pa.b Solve problems by joining or separating sets of objects or pictures with quantities to 7. (5.2) |
| MA.7.S.6.In.a Use data from a part of a group (sample) to make predictions regarding the whole group. (6.1)<br><br>MA.7.S.6.In.b Use bar graphs to display data and describe the meaning of the data. (6.2) | MA.7.S.6.Su.a Compare data shown in a pictograph with three categories and describe which categories have the largest, smallest, or the same amount. (6.1)<br><br>MA.7.S.6.Su.b Use pictographs to display data in designated (labeled) categories and identify the number in each category. (6.2) | MA.7.S.6.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify total of 7 or more. (6.1, 6.2) |
| MA.7.P.7.In.a Predict the likely outcome of a simple experiment and conduct the experiment to determine if prediction was correct. (7.1, 7.2) | MA.7.P.7.Su.a Predict the likely outcome of a simple experiment by selecting from two choices and check to see if the prediction was correct. (7.1, 7.2) | MA.7.P.7.Pa.a Recognize a common cause-effect relationship. (7.1, 7.2) |

## Grade 7 (M/J Mathematics 2 Advanced)

Big Ideas for Grade 7:

**BIG IDEA 1:** Develop an understanding of and apply proportionality, including similarity.
**BIG IDEA 2:** Develop an understanding of and use formulas to determine surface areas and volumes of three-dimensional shapes.

Additionally, most benchmarks under the three big ideas for Grade 8 are included in this course description. Here are the three big ideas for Grade 8:

**BIG IDEA 1:** Analyze and represent linear functions and solve linear equations and systems of linear equations.
**BIG IDEA 2:** Analyze two- and three-dimensional figures by using distance and angle.
**BIG IDEA 3:** Analyze and summarize data sets.

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|---|---|
| **Course Code** | 1205050 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | M/J Mathematics: 2 Advanced - 7th Advanced |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | NA |
| **Abbreviated Title** | M/J Mathematics: 2 Advanced - 7th Advanced |

**RELATED BENCHMARKS (31) :**

| Scheme | Descriptor |
|---|---|
| LA.7.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.7.3.2.2 | The student will draft writing by organizing information into a logical sequence and combining or deleting sentences to enhance clarity; and |
| MA.7.A.1.1 | Distinguish between situations that are proportional or not proportional and use proportions to solve problems. |
| MA.7.A.1.2 | Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease. |
| MA.7.A.1.3 | Solve problems involving similar figures. |
| MA.7.A.1.4 | Graph proportional relationships and identify the unit rate as the slope of the related linear function. |
| MA.7.A.1.5 | Distinguish direct variation from other relationships, including inverse variation. |
| MA.7.A.1.6 | Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed. |
| MA.7.A.5.1 | Express rational numbers as terminating or repeating decimals. |
| MA.7.G.2.1 | Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones. |
| MA.7.G.4.1 | Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and apply these relationships to solve problems. |
| MA.7.G.4.2 | Predict the results of transformations and draw transformed figures, with and without the coordinate plane. |
| MA.7.G.4.3 | Identify and plot ordered pairs in all four quadrants of the coordinate plane. |
| MA.7.P.7.1 | Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair. |
| MA.7.P.7.2 | Determine, compare, and make predictions based on experimental or theoretical |

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| | probability of independent or dependent events, |
| MA.7.S.6.1 | Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population. |
| MA.7.S.6.2 | Construct and analyze histograms, stem-and-leaf plots, and circle graphs. |
| MA.8.A.1.1 | Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data. |
| MA.8.A.1.2 | Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem. |
| MA.8.A.1.6 | Compare the graphs of linear and non-linear functions for real-world situations. |
| MA.8.A.4.2 | Solve and graph one- and two-step inequalities in one variable. |
| MA.8.A.6.1 | Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems. |
| MA.8.A.6.2 | Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions. |
| MA.8.A.6.3 | Simplify real number expressions using the laws of exponents. |
| MA.8.A.6.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real world problems. |
| MA.8.G.2.2 | Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals. |
| MA.8.G.2.3 | Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles, and the sum of angles in polygons. |
| MA.8.G.2.4 | Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane. |
| MA.8.G.5.1 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems. |
| MA.8.S.3.1 | Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships. |
| MA.8.S.3.2 | Determine and describe how changes in data values impact measures of central tendency. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.7.A.1.In.a Solve real-world problems involving simple ratios, such as 2 to 1 or 1 to 3, using physical models, graphic representations, and charts. (1.1)<br><br>MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems. (1.2)<br><br>MA.7.A.1.In.c Measure and describe how various kinds of models compare in size to real-life objects. (1.3, 1.4, 1.5, 1.6) | MA.7.A.1.Su.a Solve real-world problems involving simple ratios, such as 2 to 1, using objects or pictures. (1.1)<br><br>MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations. (1.2)<br><br>MA.7.A.1.Su.c Compare the size of models to real-life objects using language, such as same, larger, and smaller. (1.3, 1.4, 1.5, 1.6) | MA.7.A.1.Pa.a Solve a simple problem involving a 2 to 1 ratio using objects. (1.1)<br><br>MA.7.A.1.Pa.b Match objects to a model or picture that is a smaller version. (1.2, 1.3, 1.4, 1.5, 1.6) |
| MA.7.G.2.In.a Identify properties of three-dimensional figures, including pyramid, prism, and cylinder. (2.1)<br><br>MA.7.G.4.In.a Identify the effects of changes in the lengths of sides of rectangles on the perimeter and area using physical and visual models. (4.1)<br><br>MA.7.G.4.In.b Identify examples of slides (translations), turns (rotations), and flips (reflections) of geometric figures using pictures and objects. (4.2)<br><br>MA.7.G.4.In.c Identify common uses of a coordinate plane, such as a map or line graph. (4.3) | MA.7.G.2.Su.a Identify three-dimensional figures, including cone, pyramid, prism, and cylinder. (2.1)<br><br>MA.7.G.4.Su.a Recognize that changes in the lengths of sides of rectangles will make the figure or object smaller or larger. (4.1)<br><br>MA.7.G.4.Su.b Match identical (congruent) geometric figures in different positions, including flips (reflections) and turns (rotations). (4.2)<br><br>MA.7.G.4.Su.c Recognize a common use of a coordinate plane, such as a map. (4.3) | MA.7.G.2.Pa.a Recognize common three-dimensional figures, such as sphere, cube, cylinder, or cone. (2.1)<br><br>MA.7.G.4.Pa.a Match two- and three-dimensional objects with the same shape but different size. (4.1)<br><br>MA.7.G.4.Pa.b Recognize objects that have been turned (rotated). (4.2)<br><br>MA.7.G.4.Pa.c Solve problems using directional or positional language, such as up, down, left, right, and next to. (4.3) |
| MA.7.A.5.In.a Express, represent, and use percents, including 50% and 100%, and decimals in the context of money to $5.00 or more. (5.1) | MA.7.A.5.Su.a Identify the value of money to $1.00 written as a decimal. (5.1) | MA.7.A.5.Pa.a Express and use quantities 1 to 7 using objects, pictures, symbols, or number names. (5.1) |

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| MA.7.S.6.In.a Use data from a part of a group (sample) to make predictions regarding the whole group. (6.1)<br><br>MA.7.S.6.In.b Use bar graphs to display data and describe the meaning of the data. (6.2) | MA.7.S.6.Su.a Compare data shown in a pictograph with three categories and describe which categories have the largest, smallest, or the same amount. (6.1)<br><br>MA.7.S.6.Su.b Use pictographs to display data in designated (labeled) categories and identify the number in each category. (6.2) | MA.7.S.6.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify total of 7 or more. (6.1, 6.2) |
| MA.7.P.7.In.a Predict the likely outcome of a simple experiment and conduct the experiment to determine if prediction was correct. (7.1, 7.2) | MA.7.P.7.Su.a Predict the likely outcome of a simple experiment by selecting from two choices and check to see if the prediction was correct. (7.1, 7.2) | MA.7.P.7.Pa.a Recognize a common cause-effect relationship. (7.1, 7.2) |
| MA.8.A.1.In.a Use information from physical models, diagrams, tables, and graphs to solve addition, subtraction, multiplication, and division number sentences (equations) based on real-world problems. (1.1, 1.2)<br><br>MA.8.A.1.In.c Translate problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers and multiplication and division facts using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6)<br><br>MA.8.G.2.In.b Form intersecting lines and identify the angles as acute, obtuse, or right angles by matching to a model. (2.2)<br><br>MA.8.G.2.In.c Distinguish angles within triangles as acute, obtuse, or right angles using a right angle as a model. (2.3) | MA.8.A.1.Su.a Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit and two-digit numbers. (1.1, 1.2)<br><br>MA.8.A.1.Su.c Translate real-world situations into number sentences (equations) involving addition and subtraction using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6)<br><br>MA.8.G.2.Su.b Identify angles formed by lines that cross (intersecting lines). (2.2)<br><br>MA.8.G.2.Su.c Identify the angles within a triangle. (2.3) | MA.8.A.1.Pa.a Solve simple real-world problems involving quantities using language, such as number names, more, less, same, larger, smaller, and none. (1.1, 1.2, 1.3, 1.4, 1.5)<br><br>MA.8.A.1.Pa.b Solve simple problems involving joining or separating sets of objects or pictures to 8. (1.1, 1.2, 1.3, 1.4, 1.5)<br><br>MA.8.A.1.Pa.c Distinguish between the position of two objects, such as first and next. (1.5, 1.6)<br><br>MA.8.G.2.Pa.b Recognize corners and angles in two-dimensional shapes, including rectangles and triangles. (2.2, 2.3)<br><br>MA.8.G.2.Pa.c Recognize the longest side (hypotenuse) of a right triangle. (2.4) |

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| MA.8.G.2.In.d Locate the right angle and the side opposite the right angle (hypotenuse) in a right triangle. (2.4) | MA.8.G.2.Su.d Locate the right angle in a right triangle. (2.4) | |
| MA.8.S.3.In.a Organize data into categories, identify the labels, and display in bar and simple line graphs. (3.1)<br><br>MA.8.S.3.In.b Determine the largest and smallest numbers in a set of data, the number that occurs most often (mode), and the number in the middle (median) of a set of data with up to 9 numbers. (3.2) | MA.8.S.3.Su.a Organize data in pictographs and match the labels for categories. (3.1)<br><br>MA.8.S.3.Su.b Identify the number that occurs most frequently (mode) in a set of data with up to 5 numbers. (3.2) | MA.8.S.3.Pa.a Count objects, pictures, or symbols used in a pictograph or table and identify a total to 8. (3.1, 3.2) |
| MA.8.A.4.In.b Translate real-world problem situations into number sentences (equations and inequalities) involving addition, subtraction, and multiplication using visual models, tables, and graphs. (4.2) | MA.8.A.4.Su.b Translate real-world problem situations into number sentences (equations) involving addition and subtraction of one-digit and two-digit numbers using physical and visual models and tables. (4.2) | MA.8.A.4.Pa.a Identify a given quantity to 7 and add 1 more to solve problems. (4.1, 4.2)<br><br>MA.8.A.4.Pa.b Identify a given quantity to 8 and take away 1 to solve problems. (4.1, 4.2) |
| MA.8.G.5.In.a Use tools, such as charts and technology, to convert measures within the same system, including money, length, time, and capacity. (5.1) | MA.8.G.5.Su.a Use tools, such as charts, to identify standard units of measurement for length, weight, and capacity, and time. (5.1) | MA.8.G.5.Pa.a Recognize tools used for measurement, such as clocks, calendars, and rulers. (5.1) |
| MA.8.A.6.In.a Express, represent, and use whole numbers to 1000 in various contexts. (6.1)<br><br>MA.8.A.6.In.b Use a grouping strategy or place value to round whole numbers to 1000 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy. (6.2, 6.3) | MA.8.A.6.Su.a Express, represent, and use whole numbers to 100 in various contexts. (6.1)<br><br>MA.8.A.6.Su.b Use counting, grouping, and place value to identify the value of whole numbers to 100. (6.2, 6.3) | MA.8.A.6.Pa.a Identify quantity in sets to 8 using objects, pictures, symbols, or number names. (6.1).<br><br>MA.8.A.6.Pa.b Demonstrate one-to-one correspondence by counting objects or actions to 8. (6.2, 6.3) |

## Grade 8 (M/J Mathematics 3)

Big ideas for Grade 8:

**BIG IDEA 1:** Analyze and represent linear functions and solve linear equations and systems of linear equations.
**BIG IDEA 2:** Analyze two- and three-dimensional figures by using distance and angle.
**BIG IDEA 3:** Analyze and summarize data sets.

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| **Course Code** | 1205070 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | M/J Mathematics 3 - 8th Regular |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | NA |
| **Abbreviated Title** | M/J Mathematics 3 - 8th Regular |

**RELATED BENCHMARKS (22) :**

| Scheme | Descriptor |
|---|---|
| LA.8.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.8.2.2.3 | The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, or comparing/contrasting); |
| LA.8.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, main idea, logical sequence, and time frame for completion; and |
| MA.8.A.1.1 | Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data. |
| MA.8.A.1.2 | Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem. |
| MA.8.A.1.3 | Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations. |
| MA.8.A.1.4 | Identify the solution to a system of linear equations using graphs. |
| MA.8.A.1.5 | Translate among verbal, tabular, graphical and algebraic representations of linear functions. |
| MA.8.A.1.6 | Compare the graphs of linear and non-linear functions for real-world situations. |
| MA.8.A.4.1 | Solve literal equations for a specified variable. |
| MA.8.A.4.2 | Solve and graph one- and two-step inequalities in one variable. |
| MA.8.A.6.1 | Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems. |
| MA.8.A.6.2 | Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions. |

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| MA.8.A.6.3 | Simplify real number expressions using the laws of exponents. |
| MA.8.A.6.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real world problems. |
| MA.8.G.2.1 | Use similar triangles to solve problems that include height and distances. |
| MA.8.G.2.2 | Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals. |
| MA.8.G.2.3 | Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles, and the sum of angles in polygons. |
| MA.8.G.2.4 | Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane. |
| MA.8.G.5.1 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems. |
| MA.8.S.3.1 | Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships. |
| MA.8.S.3.2 | Determine and describe how changes in data values impact measures of central tendency. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.8.A.1.In.a Use information from physical models, diagrams, tables, and graphs to solve addition, subtraction, multiplication, and division number sentences (equations) based on real-world problems. (1.1, 1.2) | MA.8.A.1.Su.a Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit and two-digit numbers. (1.1, 1.2) | MA.8.A.1.Pa.a Solve simple real-world problems involving quantities using language, such as number names, more, less, same, larger, smaller, and none. (1.1, 1.2, 1.3, 1.4, 1.5) |
| MA.8.A.1.In.b Identify the relationship between two sets of related data, such as ordered number pairs, in a table. (1.3) | MA.8.A.1.Su.b Describe the relationship (1 more or 1 less) between two sets of related numbers. (1.3) | MA.8.A.1.Pa.b Solve simple problems involving joining or separating sets of objects or pictures to 8. (1.1, 1.2, 1.3, 1.4, 1.5) |
| MA.8.A.1.In.c Translate problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers and multiplication and division facts using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6) | MA.8.A.1.Su.c Translate real-world situations into number sentences (equations) involving addition and subtraction using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6) | MA.8.A.1.Pa.c Distinguish between the position of two objects, such as first and next. (1.5, 1.6) |

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| MA.8.G.2.In.a Identify triangles that are the same shape but different size (similar) using physical and visual models. (2.1)<br><br>MA.8.G.2.In.b Form intersecting lines and identify the angles as acute, obtuse, or right angles by matching to a model. (2.2)<br><br>MA.8.G.2.In.c Distinguish angles within triangles as acute, obtuse, or right angles using a right angle as a model. (2.3)<br><br>MA.8.G.2.In.d Locate the right angle and the side opposite the right angle (hypotenuse) in a right triangle. (2.4) | MA.8.G.2.Su.a Match triangles that are the same shape but different size (similar) using physical models. (2.1)<br><br>MA.8.G.2.Su.b Identify angles formed by lines that cross (intersecting lines). (2.2)<br><br>MA.8.G.2.Su.c Identify the angles within a triangle. (2.3)<br><br>MA.8.G.2.Su.d Locate the right angle in a right triangle. (2.4) | MA.8.G.2.Pa.a Recognize a triangle. (2.1)<br><br>MA.8.G.2.Pa.b Recognize corners and angles in two-dimensional shapes, including rectangles and triangles. (2.2, 2.3)<br><br>MA.8.G.2.Pa.c Recognize the longest side (hypotenuse) of a right triangle. (2.4) |
| MA.8.S.3.In.a Organize data into categories, identify the labels, and display in bar and simple line graphs. (3.1)<br><br>MA.8.S.3.In.b Determine the largest and smallest numbers in a set of data, the number that occurs most often (mode), and the number in the middle (median) of a set of data with up to 9 numbers. (3.2) | MA.8.S.3.Su.a Organize data in pictographs and match the labels for categories. (3.1)<br><br>MA.8.S.3.Su.b Identify the number that occurs most frequently (mode) in a set of data with up to 5 numbers. (3.2) | MA.8.S.3.Pa.a Count objects, pictures, or symbols used in a pictograph or table and identify a total to 8. (3.1, 3.2) |
| MA.8.A.4.In.a Identify the meaning of the variables in stated formulas (literal equations) to solve problems involving area and perimeter. (4.1)<br><br>MA.8.A.4.In.b Translate real-world problem situations into number sentences (equations and inequalities) involving addition, subtraction, and multiplication using visual models, tables, and graphs. (4.2) | MA.8.A.4.Su.a Demonstrate how to determine the total length of all the sides (perimeter) of figures, such as rectangles, to solve problems. (4.1)<br><br>MA.8.A.4.Su.b Translate real-world problem situations into number sentences (equations) involving addition and subtraction of one-digit and two-digit numbers using physical and visual models and tables. (4.2) | MA.8.A.4.Pa.a Identify a given quantity to 7 and add 1 more to solve problems. (4.1, 4.2)<br><br>MA.8.A.4.Pa.b Identify a given quantity to 8 and take away 1 to solve problems. (4.1, 4.2) |

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| MA.8.G.5.In.a Use tools, such as charts and technology, to convert measures within the same system, including money, length, time, and capacity. (5.1)<br><br>MA.8.A.6.In.a Express, represent, and use whole numbers to 1000 in various contexts. (6.1)<br><br>MA.8.A.6.In.b Use a grouping strategy or place value to round whole numbers to 1000 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy. (6.2, 6.3) | MA.8.G.5.Su.a Use tools, such as charts, to identify standard units of measurement for length, weight, and capacity, and time. (5.1)<br><br>MA.8.A.6.Su.a Express, represent, and use whole numbers to 100 in various contexts. (6.1)<br><br>MA.8.A.6.Su.b Use counting, grouping, and place value to identify the value of whole numbers to 100. (6.2, 6.3) | MA.8.G.5.Pa.a Recognize tools used for measurement, such as clocks, calendars, and rulers. (5.1)<br><br>MA.8.A.6.Pa.a Identify quantity in sets to 8 using objects, pictures, symbols, or number names. (6.1).<br><br>MA.8.A.6.Pa.b Demonstrate one-to-one correspondence by counting objects or actions to 8. (6.2, 6.3)<br><br>MA.8.A.6.Pa.c Recognize half and whole of sets of objects to 8. (6.4) |
| MA.8.A.6.In.c Express, represent, and use fractions—including halves, fourths, thirds, eighths, and sixths—using whole objects or sets, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.In.d Express, represent, and use percents—including 25%, 50%, 75%, and 100%—and decimals in the context of money. (6.4) | MA.8.A.6.Su.c Express, represent, and use fractions—such as halves, fourths, and thirds—using whole objects or sets, pictures, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.Su.d Identify percents including 50% and 100%, and values of coins and bills written as a decimal. (6.4) | |

## Grade 8 (M/J Mathematics 3 Advanced)

Big ideas for Grade 8:

**BIG IDEA 1:** Analyze and represent linear functions and solve linear equations and systems of linear equations.
**BIG IDEA 2:** Analyze two- and three-dimensional figures by using distance and angle.
**BIG IDEA 3:** Analyze and summarize data sets.

Additionally, this course description includes benchmarks that are from standard 1, standard 3, and standard 4 in the Algebra body of knowledge. Here are the standard 1, standard 3, and standard 4 from the Algebra body of knowledge:

**Standard 1: Real and Complex Number Systems**

Students expand and deepen their understanding of real and complex numbers by comparing expressions and performing arithmetic computations, especially those involving square roots and exponents. They use the properties of real numbers to simplify algebraic expressions and equations, and they convert between different measurement units using dimensional analysis.

**Standard 3: Linear Equations and Inequalities**

Students solve linear equations and inequalities.

**Standard 4: Polynomials**

Students perform operations on polynomials. They find factors of polynomials, learning special techniques for factoring quadratics. They understand the relationships among the solutions of polynomial equations, the zeros of a polynomial function, the x-intercepts of a graph, and the factors of a polynomial.

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| **Course Code** | 1205080 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | M/J Mathematics: 3 Advanced - 8th Advanced |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | NA |
| **Abbreviated Title** | M/J Mathematics: 3 Advanced - 8th Advanced |

**RELATED BENCHMARKS (29) :**

| Scheme | Descriptor |
|---|---|
| LA.8.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.8.2.2.3 | The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, or comparing/contrasting); |
| LA.8.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, main idea, logical sequence, and time frame for completion; and |
| MA.8.A.1.1 | Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data. |
| MA.8.A.1.2 | Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem. |
| MA.8.A.1.3 | Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations. |
| MA.8.A.1.4 | Identify the solution to a system of linear equations using graphs. |
| MA.8.A.1.5 | Translate among verbal, tabular, graphical and algebraic representations of linear functions. |
| MA.8.A.1.6 | Compare the graphs of linear and non-linear functions for real-world situations. |
| MA.8.A.4.1 | Solve literal equations for a specified variable. |

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| MA.8.A.4.2 | Solve and graph one- and two-step inequalities in one variable. |
| MA.8.A.6.1 | Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems. |
| MA.8.A.6.2 | Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions. |
| MA.8.A.6.3 | Simplify real number expressions using the laws of exponents. |
| MA.8.A.6.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real world problems. |
| MA.8.G.2.1 | Use similar triangles to solve problems that include height and distances. |
| MA.8.G.2.2 | Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals. |
| MA.8.G.2.3 | Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles, and the sum of angles in polygons. |
| MA.8.G.2.4 | Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane. |
| MA.8.G.5.1 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems. |
| MA.8.S.3.1 | Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships. |
| MA.8.S.3.2 | Determine and describe how changes in data values impact measures of central tendency. |
| MA.912.A.1.1 | Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers). |
| MA.912.A.1.2 | Compare real number expressions. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.3.5 | Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |
| MA.912.A.4.2 | Add, subtract, and multiply polynomials. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.8.A.1.In.a Use information from physical models, diagrams, tables, and graphs to solve addition, subtraction, multiplication, and division number sentences (equations) based on real-world problems. (1.1, 1.2)<br><br>MA.8.A.1.In.b Identify the relationship between two sets of related data, such as ordered number pairs, in a table. (1.3)<br><br>MA.8.A.1.In.c Translate problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers and multiplication and division facts using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6) | MA.8.A.1.Su.a Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit and two-digit numbers. (1.1, 1.2)<br><br>MA.8.A.1.Su.b Describe the relationship (1 more or 1 less) between two sets of related numbers. (1.3)<br><br>MA.8.A.1.Su.c Translate real-world situations into number sentences (equations) involving addition and subtraction using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6) | MA.8.A.1.Pa.a Solve simple real-world problems involving quantities using language, such as number names, more, less, same, larger, smaller, and none. (1.1, 1.2, 1.3, 1.4, 1.5)<br><br>MA.8.A.1.Pa.b Solve simple problems involving joining or separating sets of objects or pictures to 8. (1.1, 1.2, 1.3, 1.4, 1.5)<br><br>MA.8.A.1.Pa.c Distinguish between the position of two objects, such as first and next. (1.5, 1.6) |
| MA.8.G.2.In.a Identify triangles that are the same shape but different size (similar) using physical and visual models. (2.1)<br><br>MA.8.G.2.In.b Form intersecting lines and identify the angles as acute, obtuse, or right angles by matching to a model. (2.2)<br><br>MA.8.G.2.In.c Distinguish angles within triangles as acute, obtuse, or right angles using a right angle as a model. (2.3)<br><br>MA.8.G.2.In.d Locate the right angle and the side opposite the right angle (hypotenuse) in a right triangle. (2.4) | MA.8.G.2.Su.a Match triangles that are the same shape but different size (similar) using physical models. (2.1)<br><br>MA.8.G.2.Su.b Identify angles formed by lines that cross (intersecting lines). (2.2)<br><br>MA.8.G.2.Su.c Identify the angles within a triangle. (2.3)<br><br>MA.8.G.2.Su.d Locate the right angle in a right triangle. (2.4) | MA.8.G.2.Pa.a Recognize a triangle. (2.1)<br><br>MA.8.G.2.Pa.b Recognize corners and angles in two-dimensional shapes, including rectangles and triangles. (2.2, 2.3)<br><br>MA.8.G.2.Pa.c Recognize the longest side (hypotenuse) of a right triangle. (2.4) |

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| MA.8.S.3.In.a Organize data into categories, identify the labels, and display in bar and simple line graphs. (3.1)<br><br>MA.8.S.3.In.b Determine the largest and smallest numbers in a set of data, the number that occurs most often (mode), and the number in the middle (median) of a set of data with up to 9 numbers. (3.2) | MA.8.S.3.Su.a Organize data in pictographs and match the labels for categories. (3.1)<br><br>MA.8.S.3.Su.b Identify the number that occurs most frequently (mode) in a set of data with up to 5 numbers. (3.2) | MA.8.S.3.Pa.a Count objects, pictures, or symbols used in a pictograph or table and identify a total to 8. (3.1, 3.2) |
| MA.8.A.4.In.a Identify the meaning of the variables in stated formulas (literal equations) to solve problems involving area and perimeter. (4.1)<br><br>MA.8.A.4.In.b Translate real-world problem situations into number sentences (equations and inequalities) involving addition, subtraction, and multiplication using visual models, tables, and graphs. (4.2) | MA.8.A.4.Su.a Demonstrate how to determine the total length of all the sides (perimeter) of figures, such as rectangles, to solve problems. (4.1)<br><br>MA.8.A.4.Su.b Translate real-world problem situations into number sentences (equations) involving addition and subtraction of one-digit and two-digit numbers using physical and visual models and tables. (4.2) | MA.8.A.4.Pa.a Identify a given quantity to 7 and add 1 more to solve problems. (4.1, 4.2)<br><br>MA.8.A.4.Pa.b Identify a given quantity to 8 and take away 1 to solve problems. (4.1, 4.2) |
| MA.8.G.5.In.a Use tools, such as charts and technology, to convert measures within the same system, including money, length, time, and capacity. (5.1) | MA.8.G.5.Su.a Use tools, such as charts, to identify standard units of measurement for length, weight, and capacity, and time. (5.1) | MA.8.G.5.Pa.a Recognize tools used for measurement, such as clocks, calendars, and rulers. (5.1) |

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| MA.8.A.6.In.a Express, represent, and use whole numbers to 1000 in various contexts. (6.1)<br><br>MA.8.A.6.In.b Use a grouping strategy or place value to round whole numbers to 1000 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy. (6.2, 6.3)<br><br>MA.8.A.6.In.c Express, represent, and use fractions—including halves, fourths, thirds, eighths, and sixths—using whole objects or sets, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.In.d Express, represent, and use percents—including 25%, 50%, 75%, and 100%—and decimals in the context of money. (6.4) | MA.8.A.6.Su.a Express, represent, and use whole numbers to 100 in various contexts. (6.1)<br><br>MA.8.A.6.Su.b Use counting, grouping, and place value to identify the value of whole numbers to 100. (6.2, 6.3)<br><br>MA.8.A.6.Su.c Express, represent, and use fractions—such as halves, fourths, and thirds—using whole objects or sets, pictures, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.Su.d Identify percents including 50% and 100%, and values of coins and bills written as a decimal. (6.4) | MA.8.A.6.Pa.a Identify quantity in sets to 8 using objects, pictures, symbols, or number names. (6.1).<br><br>MA.8.A.6.Pa.b Demonstrate one-to-one correspondence by counting objects or actions to 8. (6.2, 6.3)<br><br>MA.8.A.6.Pa.c Recognize half and whole of sets of objects to 8. (6.4) |
| MA.912.A.1.In.a Identify and use equivalent forms of fractions, such as halves, fourths, thirds, sixths, eighths, tenths, and sixteenths; decimals to the hundredths place; and percents, such as 25%, 50%, 75%, 100%, 33%, and 67%, using visual and numerical representation in real-world situations. (1.1) | MA.912.A.1.Su.a Identify equivalent forms of fractions, such as halves, thirds, and fourths; percents, such as 50%, 33%, and 25%; and decimals in the context of money, using visual and numerical representation in real-world situations. (1.1) | MA.912.A.1.Pa.a Identify and express quantity in sets to 10 using objects, pictures, symbols, or number names. (1.1) |

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| MA.912.A.1.In.b Identify examples of positive and negative whole numbers in real-world situations. (1.1)<br><br>MA.912.A.1.In.c Determine the value of numbers to 10 with the exponents 2 and 3, such as $4^2$ and $3^3$, using physical and visual patterns. (1.1)<br><br>MA.912.A.1.In.d Compare and order numbers, including whole numbers, fractions, decimals, and percents, expressed in the same form to solve problems in real-world situations. (1.2) | MA.912.A.1.Su.b Identify the value of numbers to 5 with the exponent 2 using physical and visual models. (1.1)<br><br>MA.912.A.1.Su.c Compare and order whole numbers; fractions, including halves, fourths, thirds, and sixths; and decimals, including .25, .50, .75, and 1.00, in real-world situations. (1.2) | MA.912.A.1.Pa.b Recognize half and whole sets of objects to 10. (1.2) |
| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4)<br><br>MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15) | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4)<br><br>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15) |

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| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1)<br><br>MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication. (4.2) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1)<br><br>MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations. (4.2) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1)<br><br>MA.912.A.4.Pa.b Recognize that joining sets of objects results in a larger quantity and separating sets of objects results in a smaller quantity. (4.2) |

# Grades 9 - 12

In grades 9 – 12, students are expected to take math courses. Instructional materials for each course should be designed to meet the benchmarks assigned as part of the course descriptions provided below.

**Please note that Access Points are in draft and are expected to be approved at the State Board of Education meeting in June, 2008.**

# Pre-Algebra

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|---|---|
| **Course Code** | 1200300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Elective |
| **Course Title** | Pre-Algebra |
| **Course Level** | 1 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Pre-Algebra |

**RELATED BENCHMARKS (31) :**

| Scheme | Descriptor |
|---|---|
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |

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| MA.6.S.6.1 | Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data. |
| MA.7.A.1.1 | Distinguish between situations that are proportional or not proportional and use proportions to solve problems. |
| MA.8.A.1.1 | Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data. |
| MA.8.A.1.2 | Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem. |
| MA.8.A.1.5 | Translate among verbal, tabular, graphical and algebraic representations of linear functions. |
| MA.8.A.4.1 | Solve literal equations for a specified variable. |
| MA.8.A.6.1 | Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems. |
| MA.8.A.6.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real world problems. |
| MA.8.G.2.1 | Use similar triangles to solve problems that include height and distances. |
| MA.8.G.2.2 | Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals. |
| MA.8.G.2.3 | Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles, and the sum of angles in polygons. |
| MA.8.G.2.4 | Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane. |
| MA.8.G.5.1 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems. |
| MA.8.S.3.1 | Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships. |
| MA.912.A.1.1 | Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers). |
| MA.912.A.1.2 | Compare real number expressions. |
| MA.912.A.1.3 | Simplify real number expressions using the laws of exponents. |
| MA.912.A.1.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems. |
| MA.912.A.1.5 | Use dimensional (unit) analysis to perform conversions between units of measure, including rates. |
| MA.912.A.2.1 | Create a graph to represent a real-world situation. |
| MA.912.A.2.2 | Interpret a graph representing a real-world situation. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |

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| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.4 | Use counterexamples to show that statements are false. |
| MA.912.P.1.1 | Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces. |
| MA.912.P.2.2 | Determine probabilities of independent events. |
| MA.912.S.2.2 | Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.7.A.1.In.a Solve real-world problems involving simple ratios, such as 2 to 1 or 1 to 3, using physical models, graphic representations, and charts. (1.1) | MA.7.A.1.Su.a Solve real-world problems involving simple ratios, such as 2 to 1, using objects or pictures. (1.1) | MA.7.A.1.Pa.a Solve a simple problem involving a 2 to 1 ratio using objects. (1.1) |
| MA.8.A.1.In.a Use information from physical models, diagrams, tables, and graphs to solve addition, subtraction, multiplication, and division number sentences (equations) based on real-world problems. (1.1, 1.2)<br><br>MA.8.A.1.In.c Translate problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers and multiplication and division facts using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6) | MA.8.A.1.Su.a Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit and two-digit numbers. (1.1, 1.2)<br><br>MA.8.A.1.Su.c Translate real-world situations into number sentences (equations) involving addition and subtraction using information from physical and visual models, tables, and pictographs. (1.4, 1.5, 1.6) | MA.8.A.1.Pa.a Solve simple real-world problems involving quantities using language, such as number names, more, less, same, larger, smaller, and none. (1.1, 1.2, 1.3, 1.4, 1.5)<br><br>MA.8.A.1.Pa.b Solve simple problems involving joining or separating sets of objects or pictures to 8. (1.1, 1.2, 1.3, 1.4, 1.5) |

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| MA.8.G.2.In.a Identify triangles that are the same shape but different size (similar) using physical and visual models. (2.1)<br><br>MA.8.G.2.In.b Form intersecting lines and identify the angles as acute, obtuse, or right angles by matching to a model. (2.2)<br><br>MA.8.G.2.In.c Distinguish angles within triangles as acute, obtuse, or right angles using a right angle as a model. (2.3)<br><br>MA.8.G.2.In.d Locate the right angle and the side opposite the right angle (hypotenuse) in a right triangle. (2.4) | MA.8.G.2.Su.a Match triangles that are the same shape but different size (similar) using physical models. (2.1)<br><br>MA.8.G.2.Su.b Identify angles formed by lines that cross (intersecting lines). (2.2)<br><br>MA.8.G.2.Su.c Identify the angles within a triangle. (2.3)<br><br>MA.8.G.2.Su.d Locate the right angle in a right triangle. (2.4) | MA.8.G.2.Pa.a Recognize a triangle. (2.1)<br><br>MA.8.G.2.Pa.b Recognize corners and angles in two-dimensional shapes, including rectangles and triangles. (2.2, 2.3)<br><br>MA.8.G.2.Pa.c Recognize the longest side (hypotenuse) of a right triangle. (2.4) |
| MA.8.S.3.In.a Organize data into categories, identify the labels, and display in bar and simple line graphs. (3.1) | MA.8.S.3.Su.a Organize data in pictographs and match the labels for categories. (3.1) | MA.8.S.3.Pa.a Count objects, pictures, or symbols used in a pictograph or table and identify a total to 8. (3.1, 3.2) |
| MA.8.A.4.In.a Identify the meaning of the variables in stated formulas (literal equations) to solve problems involving area and perimeter. (4.1) | MA.8.A.4.Su.a Demonstrate how to determine the total length of all the sides (perimeter) of figures, such as rectangles, to solve problems. (4.1) | MA.8.A.4.Pa.a Identify a given quantity to 7 and add 1 more to solve problems. (4.1, 4.2)<br><br>MA.8.A.4.Pa.b Identify a given quantity to 8 and take away 1 to solve problems. (4.1, 4.2) |
| MA.8.G.5.In.a Use tools, such as charts and technology, to convert measures within the same system, including money, length, time, and capacity. (5.1) | MA.8.G.5.Su.a Use tools, such as charts, to identify standard units of measurement for length, weight, and capacity, and time. (5.1) | MA.8.G.5.Pa.a Recognize tools used for measurement, such as clocks, calendars, and rulers. (5.1) |

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| MA.8.A.6.In.a Express, represent, and use whole numbers to 1000 in various contexts. (6.1)<br><br>MA.8.A.6.In.c Express, represent, and use fractions—including halves, fourths, thirds, eighths, and sixths—using whole objects or sets, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.In.d Express, represent, and use percents—including 25%, 50%, 75%, and 100%—and decimals in the context of money. (6.4) | MA.8.A.6.Su.a Express, represent, and use whole numbers to 100 in various contexts. (6.1)<br><br>MA.8.A.6.Su.c Express, represent, and use fractions—such as halves, fourths, and thirds—using whole objects or sets, pictures, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.Su.d Identify percents including 50% and 100%, and values of coins and bills written as a decimal. (6.4) | MA.8.A.6.Pa.a Identify quantity in sets to 8 using objects, pictures, symbols, or number names. (6.1).<br><br>MA.8.A.6.Pa.c Recognize half and whole of sets of objects to 8. (6.4) |

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| MA.912.A.1.In.a Identify and use equivalent forms of fractions, such as halves, fourths, thirds, sixths, eighths, tenths, and sixteenths; decimals to the hundredths place; and percents, such as 25%, 50%, 75%, 100%, 33%, and 67%, using visual and numerical representation in real-world situations. (1.1)<br><br>MA.912.A.1.In.b Identify examples of positive and negative whole numbers in real-world situations. (1.1)<br><br>MA.912.A.1.In.c Determine the value of numbers to 10 with the exponents 2 and 3, such as $4^2$ and $3^3$, using physical and visual patterns. (1.1)<br><br>MA.912.A.1.In.d Compare and order numbers, including whole numbers, fractions, decimals, and percents, expressed in the same form to solve problems in real-world situations. (1.2)<br><br>MA.912.A.1.In.e Simplify fractions and decimals by reducing to lowest terms. (1.3)<br><br>MA.912.A.1.In.f Simplify fractions greater than 1, such as 8/4, by using division facts. (1.3)<br><br>MA.912.A.1.In.g Select the operation and solve two-step mathematical problems involving addition, subtraction, multiplication, and division of two- and three-digit numbers in real-world situations using problem-solving strategies, such as recognizing symbols and key information and using visual representations. (1.4)<br><br>MA.912.A.1.In.h Use tools, including charts and technology, to convert standard units of measurement within the same system, such as money, length, capacity, time, and weight. (1.5) | MA.912.A.1.Su.a Identify equivalent forms of fractions, such as halves, thirds, and fourths; percents, such as 50%, 33%, and 25%; and decimals in the context of money, using visual and numerical representation in real-world situations. (1.1)<br><br>MA.912.A.1.Su.b Identify the value of numbers to 5 with the exponent 2 using physical and visual models. (1.1)<br><br>MA.912.A.1.Su.c Compare and order whole numbers; fractions, including halves, fourths, thirds, and sixths; and decimals, including .25, .50, .75, and 1.00, in real-world situations. (1.2)<br><br>MA.912.A.1.Su.d Simplify whole numbers to 100 using place value and grouping with visual representation. (1.3)<br><br>MA.912.A.1.Su.e Use repeated addition of the same number to solve one-digit multiplication facts and repeated subtraction of the same number to solve one-digit division facts in real-world situations. (1.4)<br><br>MA.912.A.1.Su.f Select the operation and solve one-step mathematical problems involving addition and subtraction of one-digit and two-digit numbers in real-world situations using physical and visual representations and problem-solving strategies, such as recognizing key information and symbols. (1.4)<br><br>MA.912.A.1.Su.g Use tools, such as simple charts and technology, to convert standard units of measurement within the same system, such as money, length, and capacity. (1.5) | MA.912.A.1.Pa.a Identify and express quantity in sets to 10 using objects, pictures, symbols, or number names. (1.1)<br><br>MA.912.A.1.Pa.b Recognize half and whole sets of objects to 10. (1.2)<br><br>MA.912.A.1.Pa.c Demonstrate one-to-one correspondence by counting objects or actions to 10. (1.3)<br><br>MA.912.A.1.Pa.d Identify a given quantity to 9 and add 1 more to solve problems. (1.4)<br><br>MA.912.A.1.Pa.e Identify a given quantity to 10 and take away 1 to solve problems. (1.4)<br><br>MA.912.A.1.Pa.f Identify tools used for measurement, such as clocks, calendars, rulers, or gallon containers. (1.5) |

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| MA.912.A.2.In.a Organize data from real-world situations into categories, identify the labels, and display in simple bar, line, and circle graphs. (2.1)<br><br>MA.912.A.2.In.b Interpret simple bar, line, and circle graphs representing data from real-world situations. (2.2) | MA.912.A.2.Su.a Organize data from real-world situations into categories, identify the labels, and display in pictographs and bar graphs. (2.1)<br><br>MA.912.A.2.Su.b Identify which categories have the largest, smallest, or the same amount in pictographs and bar graphs representing real-world situations. (2.2) | MA.912.A.2.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify a total to 10. (2.1, 2.2) |
| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4)<br><br>MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2) | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4)<br><br>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3) |
| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1) |

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| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.P.1.In.a Use visual representations, such as drawings or charts, to show possible combinations with three elements. (1.1) | MA.912.P.1.Su.a Use physical representations to show possible combinations with two elements. (1.1) | MA.912.P.1.Pa.a Recognize the probability of an event as certain or impossible. (1.1) |
| MA.912.P.2.In.a Identify if given outcomes for events in real-world situations are certain, likely, or impossible based on data in a graph or chart. (2.1, 2.2) | MA.912.P.2.Su.a Predict the likely outcome of a simple experiment or event by selecting from three choices of outcomes. (2.1, 2.2) | MA.912.P.2.Pa.a Predict the next activity in real-world situations. (2.1, 2.2) |

# Algebra 1

**Course Code** 1200310
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Core
**Course Title** Algebra 1
**Course Level** 2
**Course Length** Full year
**Credit Description** 1
**Abbreviated Title** Algebra 1

**RELATED BENCHMARKS (40) :**

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |

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| LA.910.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.1.8 | Use the zero product property of real numbers in a variety of contexts to identify solutions to equations. |
| MA.912.A.2.3 | Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.4 | Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution. |
| MA.912.A.3.5 | Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities. |
| MA.912.A.3.7 | Rewrite equations of a line into slope-intercept form and standard form. |
| MA.912.A.3.8 | Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form . |
| MA.912.A.3.9 | Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |
| MA.912.A.3.11 | Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change. |
| MA.912.A.3.12 | Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph. |
| MA.912.A.3.13 | Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |
| MA.912.A.4.2 | Add, subtract, and multiply polynomials. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.5.1 | Simplify algebraic ratios. |
| MA.912.A.5.4 | Solve algebraic proportions. |

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| MA.912.A.6.1 | Simplify radical expressions |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.7.1 | Graph quadratic equations with and without graphing technology. |
| MA.912.A.7.2 | Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula. |
| MA.912.A.7.8 | Use quadratic equations to solve real-world problems. |
| MA.912.A.7.10 | Use graphing technology to find approximate solutions of quadratic equations. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.D.7.1 | Perform set operations such as union and intersection, and complement. |
| MA.912.D.7.2 | Use Venn diagrams to explore relationships and patterns, and to make arguments about relationships between sets. |
| MA.912.G.1.4 | Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph. (2.3)<br><br>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12)<br><br>MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12)<br><br>MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12)<br><br>MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3) |

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| MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |

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| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1)<br><br>MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication. (4.2)<br><br>MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1)<br><br>MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations. (4.2)<br><br>MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1)<br><br>MA.912.A.4.Pa.b Recognize that joining sets of objects results in a larger quantity and separating sets of objects results in a smaller quantity. (4.2)<br><br>MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.5.In.a Use numbers to represent ratios in real-world situations. (5.1)<br><br>MA.912.A.5.In.b Solve problems involving ratios in real-world situations. (5.4) | MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems. (5.1, 5.4) | MA.912.A.5.Pa.a Identify a simple ratio, such as 1 to 2, to solve real-world problems. (5.1, 5.4) |
| MA.912.A.6.In.a Identify perfect squares and their factors, including 1, 4, 9, 16, 25, 49, 64, 100, and 144, using visual models. (6.1)<br><br>MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |
| MA.912.A.7.In.a Use information from tables and visual models to plot numbers on a line graph representing real-world situations. (7.1)<br><br>MA.912.A.7.In.b Compare quantities from real-world situations represented on a graph and explain similarities and differences. (7.2) | MA.912.A.7.Su.a Identify information from tables and simple line graphs representing real-world situations. (7.1)<br><br>MA.912.A.7.Su.b Compare quantities from similar real-world situations represented on a graph. (7.2) | MA.912.A.7.Pa.a Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which groups have more or less. (7.1, 7.2)<br><br>MA.912.A.7.Pa.b Solve problems by joining or separating quantities to 10 using objects, pictures, or symbols. (7.8) |

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| MA.912.A.7.In.c Use equations involving addition, subtraction, multiplication, and division of whole numbers to solve real-world problems. (7.8) | MA.912.A.7.Su.c Solve number sentences (equations) using visual and physical models representing real-world situations. (7.8) | |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.D.7.In.a Identify and sort elements in two sets, combine the sets to identify elements in either set to form a union, and identify the elements that are in both sets (intersection) using physical and visual models. (7.1)<br><br>MA.912.D.7.In.b Use Venn diagrams to represent the elements in both sets (intersection) of two sets. (7.2) | MA.912.D.7.Su.a Sort elements into two sets and combine elements in either set to form a union using physical and visual models. (7.1)<br><br>MA.912.D.7.Su.b Use physical models to identify elements from both sets that belong together (intersection). (7.2) | MA.912.D.7.Pa.a Sort the common element from two sets of objects. (7.1, 7.2) |
| MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers. (1/4) | MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid. (1.4) | MA.912.G.1.Pa.c Solve real-world problems involving points, lines, angles, and areas (planes) using directional and positional language. (1.4) |

# Algebra 1 Honors

**Course Code** 1200320
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Core

**Course Title** Algebra 1 Honors
**Course Level** 3
**Course Length** Full Year
**Credit Description** 1
**Abbreviated Title** Algebra 1 Honors

**RELATED BENCHMARKS (46) :**

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.1.8 | Use the zero product property of real numbers in a variety of contexts to identify solutions to equations. |
| MA.912.A.2.3 | Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.4 | Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution. |
| MA.912.A.3.5 | Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities. |
| MA.912.A.3.6 | Solve and graph the solutions of absolute value equations and inequalities with one variable. |
| MA.912.A.3.7 | Rewrite equations of a line into slope-intercept form and standard form. |
| MA.912.A.3.8 | Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form . |
| MA.912.A.3.9 | Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |
| MA.912.A.3.11 | Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change. |
| MA.912.A.3.12 | Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph. |

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| MA.912.A.3.13 | Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |
| MA.912.A.4.2 | Add, subtract, and multiply polynomials. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.5.1 | Simplify algebraic ratios. |
| MA.912.A.5.2 | Add, subtract, multiply, and divide rational expressions. |
| MA.912.A.5.3 | Simplify complex fractions. |
| MA.912.A.5.4 | Solve algebraic proportions. |
| MA.912.A.5.5 | Solve rational equations. |
| MA.912.A.5.7 | Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio). |
| MA.912.A.6.1 | Simplify radical expressions |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.7.1 | Graph quadratic equations with and without graphing technology. |
| MA.912.A.7.2 | Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula. |
| MA.912.A.7.6 | Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola. |
| MA.912.A.7.8 | Use quadratic equations to solve real-world problems. |
| MA.912.A.7.10 | Use graphing technology to find approximate solutions of quadratic equations. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.D.7.1 | Perform set operations such as union and intersection, and complement. |
| MA.912.D.7.2 | Use Venn diagrams to explore relationships and patterns, and to make arguments about relationships between sets. |
| MA.912.G.1.4 | Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines. |

| Access Points for Students with Significant Cognitive Disabilities | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph. (2.3)<br><br>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4)<br><br>MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3) | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4)<br><br>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14) |

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| MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |
| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1)<br><br>MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication. (4.2)<br><br>MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1)<br><br>MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations. (4.2)<br><br>MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1)<br><br>MA.912.A.4.Pa.b Recognize that joining sets of objects results in a larger quantity and separating sets of objects results in a smaller quantity. (4.2)<br><br>MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.5.In.a Use numbers to represent ratios in real-world situations. (5.1)<br><br>MA.912.A.5.In.b Solve problems involving ratios in real-world situations. (5.4) | MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems. (5.1, 5.4) | MA.912.A.5.Pa.a Identify a simple ratio, such as 1 to 2, to solve real-world problems. (5.1, 5.4) |

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| MA.912.A.6.In.a Identify perfect squares and their factors, including 1, 4, 9, 16, 25, 49, 64, 100, and 144, using visual models. (6.1)<br><br>MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |
| MA.912.A.7.In.a Use information from tables and visual models to plot numbers on a line graph representing real-world situations. (7.1)<br><br>MA.912.A.7.In.b Compare quantities from real-world situations represented on a graph and explain similarities and differences. (7.2)<br><br>MA.912.A.7.In.c Use equations involving addition, subtraction, multiplication, and division of whole numbers to solve real-world problems. (7.8) | MA.912.A.7.Su.a Identify information from tables and simple line graphs representing real-world situations. (7.1)<br><br>MA.912.A.7.Su.b Compare quantities from similar real-world situations represented on a graph. (7.2)<br><br>MA.912.A.7.Su.c Solve number sentences (equations) using visual and physical models representing real-world situations. (7.8) | MA.912.A.7.Pa.a Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which groups have more or less. (7.1, 7.2)<br><br>MA.912.A.7.Pa.b Solve problems by joining or separating quantities to 10 using objects, pictures, or symbols. (7.8) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |

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| MA.912.D.7.In.a Identify and sort elements in two sets, combine the sets to identify elements in either set to form a union, and identify the elements that are in both sets (intersection) using physical and visual models. (7.1)<br><br>MA.912.D.7.In.b Use Venn diagrams to represent the elements in both sets (intersection) of two sets. (7.2) | MA.912.D.7.Su.a Sort elements into two sets and combine elements in either set to form a union using physical and visual models. (7.1)<br><br>MA.912.D.7.Su.b Use physical models to identify elements from both sets that belong together (intersection). (7.2) | MA.912.D.7.Pa.a Sort the common element from two sets of objects. (7.1, 7.2) |
| MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers. (1/4) | MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid. (1.4) | MA.912.G.1.Pa.c Solve real-world problems involving points, lines, angles, and areas (planes) using directional and positional language. (1.4) |

# Algebra 2

**Course Code** 1200330
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Core
**Course Title** Algebra 2
**Course Level** 2
**Course Length** Full Year
**Credit Description** 1
**Abbreviated Title** Algebra 2

**RELATED BENCHMARKS (43) :**

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.4.2.1 | The student will write in a variety of informational/expository forms, including a variety of technical documents (e.g., how-to-manuals, procedures, assembly directions); |
| MA.912.A.1.6 | Identify the real and imaginary parts of complex numbers and perform basic operations. |
| MA.912.A.2.5 | Graph absolute value equations and inequalities in two variables. |
| MA.912.A.2.6 | Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value). |
| MA.912.A.2.7 | Perform operations (addition, subtraction, division and multiplication) of functions algebraically, numerically, and graphically. |
| MA.912.A.2.8 | Determine the composition of functions. |
| MA.912.A.2.10 | Describe and graph transformations of functions |

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| MA.912.A.2.11 | Solve problems involving functions and their inverses. |
| MA.912.A.2.12 | Solve problems using direct, inverse, and joint variations. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.6 | Solve and graph the solutions of absolute value equations and inequalities with one variable. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. |
| MA.912.A.4.10 | Use polynomial equations to solve real-world problems. |
| MA.912.A.5.2 | Add, subtract, multiply, and divide rational expressions. |
| MA.912.A.5.3 | Simplify complex fractions. |
| MA.912.A.5.5 | Solve rational equations. |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.6.3 | Simplify expressions using properties of rational exponents. |
| MA.912.A.6.4 | Convert between rational exponent and radical forms of expressions. |
| MA.912.A.6.5 | Solve equations that contain radical expressions. |
| MA.912.A.7.3 | Solve quadratic equations over the real numbers by completing the square. |
| MA.912.A.7.4 | Use the discriminant to determine the nature of the roots of a quadratic equation. |
| MA.912.A.7.5 | Solve quadratic equations over the complex number system. |
| MA.912.A.7.6 | Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola. |
| MA.912.A.8.1 | Define exponential and logarithmic functions and determine their relationship |
| MA.912.A.8.2 | Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values. |
| MA.912.A.8.3 | Graph exponential and logarithmic functions. |
| MA.912.A.8.5 | Solve logarithmic and exponential equations. |

MA.912.A.8.6 Use the change of base formula.

MA.912.A.8.7 Solve applications of exponential growth and decay.

MA.912.A.10.3 Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions).

MA.912.D.11.1 Define arithmetic and geometric sequences and series.

MA.912.D.11.3 Find specified terms of arithmetic and geometric sequences.

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |

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| MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |
| MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |

# Algebra 2 Honors

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| **Course Code** | 1200340 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Algebra 2 Honors |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Algebra 2 Honors |

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.4.2.1 | The student will write in a variety of informational/expository forms, including a variety of technical documents (e.g., how-to-manuals, procedures, assembly directions); |
| MA.912.A.1.6 | Identify the real and imaginary parts of complex numbers and perform basic operations. |
| MA.912.A.2.5 | Graph absolute value equations and inequalities in two variables. |
| MA.912.A.2.6 | Identify and graph common functions (including but not limited to linear, rational, |

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| | quadratic, cubic, radical, absolute value). |
| MA.912.A.2.7 | Perform operations (addition, subtraction, division and multiplication) of functions algebraically, numerically, and graphically. |
| MA.912.A.2.8 | Determine the composition of functions. |
| MA.912.A.2.9 | Recognize, interpret, and graph functions defined piece-wise, with and without technology. |
| MA.912.A.2.10 | Describe and graph transformations of functions |
| MA.912.A.2.11 | Solve problems involving functions and their inverses. |
| MA.912.A.2.12 | Solve problems using direct, inverse, and joint variations. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. |
| MA.912.A.4.10 | Use polynomial equations to solve real-world problems. |
| MA.912.A.4.11 | Solve a polynomial inequality by examining the graph with and without the use of technology. |
| MA.912.A.4.12 | Apply the Binomial Theorem. |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.6.3 | Simplify expressions using properties of rational exponents. |
| MA.912.A.6.4 | Convert between rational exponent and radical forms of expressions. |
| MA.912.A.6.5 | Solve equations that contain radical expressions. |
| MA.912.A.7.3 | Solve quadratic equations over the real numbers by completing the square. |
| MA.912.A.7.4 | Use the discriminant to determine the nature of the roots of a quadratic equation. |
| MA.912.A.7.5 | Solve quadratic equations over the complex number system. |
| MA.912.A.7.6 | Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola. |
| MA.912.A.7.7 | Solve non-linear systems of equations with and without using technology. |
| MA.912.A.7.10 | Use graphing technology to find approximate solutions of quadratic equations. |

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| MA.912.A.8.1 | Define exponential and logarithmic functions and determine their relationship |
| MA.912.A.8.2 | Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values. |
| MA.912.A.8.3 | Graph exponential and logarithmic functions. |
| MA.912.A.8.5 | Solve logarithmic and exponential equations. |
| MA.912.A.8.6 | Use the change of base formula. |
| MA.912.A.8.7 | Solve applications of exponential growth and decay. |
| MA.912.A.9.1 | Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.). |
| MA.912.A.9.2 | Graph conic sections with and without using graphing technology. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.D.11.1 | Define arithmetic and geometric sequences and series. |
| MA.912.D.11.2 | Use sigma notation to describe series. |
| MA.912.D.11.3 | Find specified terms of arithmetic and geometric sequences. |
| MA.912.D.11.4 | Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable. |
| MA.912.G.6.6 | Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle. |
| MA.912.G.6.7 | Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14) |

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| MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |
| MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.G.6.In.c Determine the relationship between a semi-circle and a circle. (6.6) | MA.912.G.6.Su.c Identify examples of semi-circles in the environment. (6.6) | MA.912.G.6.Pa.a Identify objects, pictures, or signs with a circle in real-world situations. (6.2, 6.6) |

# Algebra 1A

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|---|---|
| **Course Code** | 1200370 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Algebra 1a |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Algebra 1a |

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.3 | The student will use context clues to determine meanings of unfamiliar words; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |

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| MA.912.A.1.1 | Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers). |
| MA.912.A.1.2 | Compare real number expressions. |
| MA.912.A.1.3 | Simplify real number expressions using the laws of exponents. |
| MA.912.A.1.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems. |
| MA.912.A.1.5 | Use dimensional (unit) analysis to perform conversions between units of measure, including rates. |
| MA.912.A.2.1 | Create a graph to represent a real-world situation. |
| MA.912.A.2.2 | Interpret a graph representing a real-world situation. |
| MA.912.A.2.3 | Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.4 | Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution. |
| MA.912.A.3.5 | Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities. |
| MA.912.A.3.7 | Rewrite equations of a line into slope-intercept form and standard form. |
| MA.912.A.3.8 | Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form . |
| MA.912.A.3.9 | Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |
| MA.912.A.3.11 | Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change. |
| MA.912.A.3.12 | Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |

MA.912.D.7.1 Perform set operations such as union and intersection, and complement.

MA.912.D.7.2 Use Venn diagrams to explore relationships and patterns, and to make arguments about relationships between sets.

MA.912.G.1.4 Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.1.In.a Identify and use equivalent forms of fractions, such as halves, fourths, thirds, sixths, eighths, tenths, and sixteenths; decimals to the hundredths place; and percents, such as 25%, 50%, 75%, 100%, 33%, and 67%, using visual and numerical representation in real-world situations. (1.1)<br><br>MA.912.A.1.In.b Identify examples of positive and negative whole numbers in real-world situations. (1.1)<br><br>MA.912.A.1.In.c Determine the value of numbers to 10 with the exponents 2 and 3, such as $4^2$ and $3^3$, using physical and visual patterns. (1.1)<br><br>MA.912.A.1.In.d Compare and order numbers, including whole numbers, fractions, decimals, and percents, expressed in the same form to solve problems in real-world situations. (1.2) | MA.912.A.1.Su.a Identify equivalent forms of fractions, such as halves, thirds, and fourths; percents, such as 50%, 33%, and 25%; and decimals in the context of money, using visual and numerical representation in real-world situations. (1.1)<br><br>MA.912.A.1.Su.b Identify the value of numbers to 5 with the exponent 2 using physical and visual models. (1.1)<br><br>MA.912.A.1.Su.c Compare and order whole numbers; fractions, including halves, fourths, thirds, and sixths; and decimals, including .25, .50, .75, and 1.00, in real-world situations. (1.2)<br><br>MA.912.A.1.Su.d Simplify whole numbers to 100 using place value and grouping with visual representation. (1.3)<br><br>MA.912.A.1.Su.e Use repeated addition of the same number to solve one-digit multiplication facts and repeated subtraction of the same number to solve one-digit division facts in real-world situations. (1.4) | MA.912.A.1.Pa.a Identify and express quantity in sets to 10 using objects, pictures, symbols, or number names. (1.1)<br><br>MA.912.A.1.Pa.b Recognize half and whole sets of objects to 10. (1.2)<br><br>MA.912.A.1.Pa.c Demonstrate one-to-one correspondence by counting objects or actions to 10. (1.3)<br><br>MA.912.A.1.Pa.d Identify a given quantity to 9 and add 1 more to solve problems. (1.4)<br><br>MA.912.A.1.Pa.e Identify a given quantity to 10 and take away 1 to solve problems. (1.4)<br><br>MA.912.A.1.Pa.f Identify tools used for measurement, such as clocks, calendars, rulers, or gallon containers. (1.5) |

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| MA.912.A.1.In.e Simplify fractions and decimals by reducing to lowest terms. (1.3)<br><br>MA.912.A.1.In.f Simplify fractions greater than 1, such as 8/4, by using division facts. (1.3)<br><br>MA.912.A.1.In.g Select the operation and solve two-step mathematical problems involving addition, subtraction, multiplication, and division of two- and three-digit numbers in real-world situations using problem-solving strategies, such as recognizing symbols and key information and using visual representations. (1.4)<br><br>MA.912.A.1.In.h Use tools, including charts and technology, to convert standard units of measurement within the same system, such as money, length, capacity, time, and weight. (1.5) | MA.912.A.1.Su.f Select the operation and solve one-step mathematical problems involving addition and subtraction of one-digit and two-digit numbers in real-world situations using physical and visual representations and problem-solving strategies, such as recognizing key information and symbols. (1.4)<br><br>MA.912.A.1.Su.g Use tools, such as simple charts and technology, to convert standard units of measurement within the same system, such as money, length, and capacity. (1.5) | |

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| MA.912.A.2.In.a Organize data from real-world situations into categories, identify the labels, and display in simple bar, line, and circle graphs. (2.1)<br><br>MA.912.A.2.In.b Interpret simple bar, line, and circle graphs representing data from real-world situations. (2.2)<br><br>MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph. (2.3)<br><br>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.a Organize data from real-world situations into categories, identify the labels, and display in pictographs and bar graphs. (2.1)<br><br>MA.912.A.2.Su.b Identify which categories have the largest, smallest, or the same amount in pictographs and bar graphs representing real-world situations. (2.2)<br><br>MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify a total to 10. (2.1, 2.2)<br><br>MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |

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| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4)<br><br>MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4)<br><br>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |

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| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.D.7.In.a Identify and sort elements in two sets, combine the sets to identify elements in either set to form a union, and identify the elements that are in both sets (intersection) using physical and visual models. (7.1)<br><br>MA.912.D.7.In.b Use Venn diagrams to represent the elements in both sets (intersection) of two sets. (7.2) | MA.912.D.7.Su.a Sort elements into two sets and combine elements in either set to form a union using physical and visual models. (7.1)<br><br>MA.912.D.7.Su.b Use physical models to identify elements from both sets that belong together (intersection). (7.2) | MA.912.D.7.Pa.a Sort the common element from two sets of objects. (7.1, 7.2) |
| MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers. (1/4) | MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid. (1.4) | MA.912.G.1.Pa.c Solve real-world problems involving points, lines, angles, and areas (planes) using directional and positional language. (1.4) |

# Algebra 1B

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| **Course Code** | 1200380 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Algebra 1b |
| **Course Level** | 2 |
| **Course Length** | Full Year |

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|---|---|
| **Credit Description** | 1 |
| **Abbreviated Title** | Algebra 1b |

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.1.8 | Use the zero product property of real numbers in a variety of contexts to identify solutions to equations. |
| MA.912.A.3.13 | Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |
| MA.912.A.4.2 | Add, subtract, and multiply polynomials. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.5.1 | Simplify algebraic ratios. |
| MA.912.A.5.4 | Solve algebraic proportions. |
| MA.912.A.6.1 | Simplify radical expressions |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.7.1 | Graph quadratic equations with and without graphing technology. |
| MA.912.A.7.2 | Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula. |
| MA.912.A.7.8 | Use quadratic equations to solve real-world problems. |
| MA.912.A.7.10 | Use graphing technology to find approximate solutions of quadratic equations. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |
| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1)<br><br>MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication. (4.2)<br><br>MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1)<br><br>MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations. (4.2)<br><br>MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1)<br><br>MA.912.A.4.Pa.b Recognize that joining sets of objects results in a larger quantity and separating sets of objects results in a smaller quantity. (4.2)<br><br>MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.5.In.a Use numbers to represent ratios in real-world situations. (5.1)<br><br>MA.912.A.5.In.b Solve problems involving ratios in real-world situations. (5.4) | MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems. (5.1, 5.4) | MA.912.A.5.Pa.a Identify a simple ratio, such as 1 to 2, to solve real-world problems. (5.1, 5.4) |

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|---|---|---|
| MA.912.A.6.In.a Identify perfect squares and their factors, including 1, 4, 9, 16, 25, 49, 64, 100, and 144, using visual models. (6.1)<br><br>MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |
| MA.912.A.7.In.a Use information from tables and visual models to plot numbers on a line graph representing real-world situations. (7.1)<br><br>MA.912.A.7.In.b Compare quantities from real-world situations represented on a graph and explain similarities and differences. (7.2)<br><br>MA.912.A.7.In.c Use equations involving addition, subtraction, multiplication, and division of whole numbers to solve real-world problems. (7.8) | MA.912.A.7.Su.a Identify information from tables and simple line graphs representing real-world situations. (7.1)<br><br>MA.912.A.7.Su.b Compare quantities from similar real-world situations represented on a graph. (7.2)<br><br>MA.912.A.7.Su.c Solve number sentences (equations) using visual and physical models representing real-world situations. (7.8) | MA.912.A.7.Pa.a Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which groups have more or less. (7.1, 7.2)<br><br>MA.912.A.7.Pa.b Solve problems by joining or separating quantities to 10 using objects, pictures, or symbols. (7.8) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |

# Mathematical Analysis

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| **Course Code** | 1201300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Mathematical Analysis |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Mathematical Analysis |

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; |
| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.1112.3.2.2 | The student will draft writing by establishing a logical organizational pattern with supporting details that are substantial, specific, and relevant; and |
| MA.912.A.2.1 | Create a graph to represent a real-world situation. |
| MA.912.A.2.2 | Interpret a graph representing a real-world situation. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.6 | Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value). |
| MA.912.A.2.9 | Recognize, interpret, and graph functions defined piece-wise, with and without technology. |
| MA.912.A.2.10 | Describe and graph transformations of functions |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' |

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| | Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. |
| MA.912.A.4.10 | Use polynomial equations to solve real-world problems. |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. |
| MA.912.A.5.7 | Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio). |
| MA.912.A.8.3 | Graph exponential and logarithmic functions. |
| MA.912.C.1.1 | Understand the concept of limit and estimate limits from graphs and tables of values. |
| MA.912.C.1.2 | Find limits by substitution. |
| MA.912.C.1.3 | Find limits of sums, differences, products, and quotients. |
| MA.912.C.1.4 | Find limits of rational functions that are undefined at a point. |
| MA.912.C.1.9 | Understand continuity in terms of limits. |
| MA.912.C.1.10 | Decide if a function is continuous at a point. |
| MA.912.C.1.11 | Find the types of discontinuities of a function. |
| MA.912.D.1.3 | Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications. |
| MA.912.D.6.6 | Construct logical arguments using laws of detachment (modus ponens), syllogism, tautology, and contradiction; judge the validity of arguments, and give counterexamples to disprove statements. |
| MA.912.D.8.2 | Use matrix operations to solve problems. |
| MA.912.D.8.3 | Use row-reduction techniques to solve problems. |
| MA.912.D.8.4 | Find the inverse of a matrix and use the inverse to solve problems with and without the use of technology. |
| MA.912.D.8.6 | Use matrices to solve Markov chain problems that link present events to future events using probabilities. |
| MA.912.D.11.4 | Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable. |
| MA.912.P.1.1 | Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces. |
| MA.912.P.1.2 | Use formulas for permutations and combinations to count outcomes and determine probabilities of events. |
| MA.912.P.2.3 | Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events; finding conditional probabilities from a two-way frequency table. |
| MA.912.P.3.3 | Apply the properties of the normal distribution. |

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| MA.912.S.3.3 | Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data. |
| MA.912.S.3.4 | Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data. |
| MA.912.S.3.6 | Use empirical rules (e.g. 68-95-99.7 rule) to estimate spread of distributions and to make comparisons among sets of data. |
| MA.912.S.3.8 | Determine whether a data distribution is symmetric or skewed based on an appropriate graphical presentation of the data. |
| MA.912.S.3.9 | Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.a Organize data from real-world situations into categories, identify the labels, and display in simple bar, line, and circle graphs. (2.1)<br><br>MA.912.A.2.In.b Interpret simple bar, line, and circle graphs representing data from real-world situations. (2.2)<br><br>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.a Organize data from real-world situations into categories, identify the labels, and display in pictographs and bar graphs. (2.1)<br><br>MA.912.A.2.Su.b Identify which categories have the largest, smallest, or the same amount in pictographs and bar graphs representing real-world situations. (2.2)<br><br>MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify a total to 10. (2.1, 2.2)<br><br>MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |

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| MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14) |
| MA.912.P.1.In.a Use visual representations, such as drawings or charts, to show possible combinations with three elements. (1.1) | MA.912.P.1.Su.a Use physical representations to show possible combinations with two elements. (1.1) | MA.912.P.1.Pa.a Recognize the probability of an event as certain or impossible. (1.1) |
| MA.912.S.3.In.c Determine the mode by identifying the number that occurs most often and the mean by finding the average. (3.3) | MA.912.S.3.Su.c Identify the number that occurs most frequently (mode) in a set of data with up to nine numbers. (3.3) | MA.912.S.3.Pa.a Identify quantity in data sets of 10 by counting objects, pictures, or symbols and identify which category has more, less, or none. (3.1, 3.2, 3.3, 3.5) |

# Analysis of Functions

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| **Course Code** | 1201310 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Analysis of Functions |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Analysis of Functions |
| Scheme | Descriptor |
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, |

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| | and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; |
| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.1112.3.2.2 | The student will draft writing by establishing a logical organizational pattern with supporting details that are substantial, specific, and relevant; and |
| MA.912.A.2.1 | Create a graph to represent a real-world situation. |
| MA.912.A.2.2 | Interpret a graph representing a real-world situation. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.6 | Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value). |
| MA.912.A.2.9 | Recognize, interpret, and graph functions defined piece-wise, with and without technology. |
| MA.912.A.2.10 | Describe and graph transformations of functions |
| MA.912.A.2.11 | Solve problems involving functions and their inverses. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. |
| MA.912.A.4.10 | Use polynomial equations to solve real-world problems. |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. |
| MA.912.A.5.7 | Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio). |
| MA.912.A.8.3 | Graph exponential and logarithmic functions. |
| MA.912.A.8.7 | Solve applications of exponential growth and decay. |
| MA.912.T.1.1 | Convert between degree and radian measures. |
| MA.912.T.1.4 | Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology. |
| MA.912.T.1.6 | Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology. |
| MA.912.T.1.7 | Define and graph inverse trigonometric relations and functions. |

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| MA.912.T.1.8 | Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.a Organize data from real-world situations into categories, identify the labels, and display in simple bar, line, and circle graphs. (2.1)<br><br>MA.912.A.2.In.b Interpret simple bar, line, and circle graphs representing data from real-world situations. (2.2)<br><br>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.a Organize data from real-world situations into categories, identify the labels, and display in pictographs and bar graphs. (2.1)<br><br>MA.912.A.2.Su.b Identify which categories have the largest, smallest, or the same amount in pictographs and bar graphs representing real-world situations. (2.2)<br><br>MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify a total to 10. (2.1, 2.2)<br><br>MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Calculus

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| **Course Code** | 1202300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Calculus |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit** | 1 |

| **Description** | |
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| **Abbreviated Title** | Calculus |
| Scheme | Descriptor |
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.6.9 | The student will determine the correct meaning of words with multiple meanings in context; |
| LA.1112.2.2.3 | The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, comparing, contrasting, outlining); |
| MA.912.C.1.6 | Find limits at infinity. |
| MA.912.C.1.7 | Decide when a limit is infinite and use limits involving infinity to describe asymptotic behavior. |
| MA.912.C.1.8 | Find special limits such as $\lim_{x \to 0} \frac{sinx}{x}$ |
| MA.912.C.2.1 | Understand the concept of derivative geometrically, numerically, and analytically, and interpret the derivative as an instantaneous rate of change, or as the slope of the tangent line. |
| MA.912.C.2.2 | State, understand, and apply the definition of derivative. |
| MA.912.C.2.3 | Find the derivatives of functions, including algebraic, trigonometric, logarithmic, and exponential functions. |
| MA.912.C.2.4 | Find the derivatives of sums, products, and quotients. |
| MA.912.C.2.5 | Find the derivatives of composite functions, using the Chain Rule. |
| MA.912.C.2.6 | Find the derivatives of implicitly-defined functions. |
| MA.912.C.2.7 | Find derivatives of inverse functions. |
| MA.912.C.2.8 | Find second derivatives and derivatives of higher order. |
| MA.912.C.2.9 | Find derivatives using logarithmic differentiation. |
| MA.912.C.2.10 | Understand and use the relationship between differentiability and continuity. |
| MA.912.C.2.11 | Understand and apply the Mean Value Theorem. |
| MA.912.C.3.1 | Find the slope of a curve at a point, including points at which there are vertical tangent lines and no tangent lines. |
| MA.912.C.3.2 | Find an equation for the tangent line to a curve at a point and a local linear approximation. |
| MA.912.C.3.3 | Decide where functions are decreasing and increasing. Understand the relationship between the increasing and decreasing behavior of *f* and the sign of *f'*. |
| MA.912.C.3.4 | Find local and absolute maximum and minimum points. |
| MA.912.C.3.5 | Find points of inflection of functions. Understand the relationship between the concavity of f and the sign of f. Understand points of inflection as places where concavity changes. |
| MA.912.C.3.6 | Use first and second derivatives to help sketch graphs. Compare the corresponding characteristics of the graphs of f, f', and f." |
| MA.912.C.3.7 | Use implicit differentiation to find the derivative of an inverse function. |
| MA.912.C.3.8 | Solve optimization problems. |
| MA.912.C.3.9 | Find average and instantaneous rates of change. Understand the instantaneous rate of change as the limit of the average rate of change. Interpret a derivative as a rate of |

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| | change in applications, including velocity, speed, and acceleration. |
| MA.912.C.3.10 | Find the velocity and acceleration of a particle moving in a straight line. |
| MA.912.C.3.11 | Model rates of change, including related rates problems. |
| MA.912.C.4.1 | Use rectangle approximations to find approximate values of integrals. |
| MA.912.C.4.2 | Calculate the values of Riemann Sums over equal subdivisions using left, right, and midpoint evaluation points. |
| MA.912.C.4.3 | Interpret a definite integral as a limit of Riemann sums. |
| MA.912.C.4.4 | Interpret a definite integral of the rate of change of a quantity over an interval as the change of the quantity over the interval. That is, $\int_a^b f'(x)dx = f(b) - f(a)$ (Fundamental Theorem of Calculus) |
| MA.912.C.4.5 | Use the Fundamental Theorem of Calculus to evaluate definite and indefinite integrals and to represent particular antiderivatives. Perform analytical and graphical analysis of functions so defined. |
| MA.912.C.4.6 | Use these properties of definite integrals:<br>• $\int_a^b [f(x) + g(x)]dx = \int_a^b f(x)dx + \int_a^b g(x)dx$<br>• $\int_a^b k \cdot f(x)dx = k\int_a^b f(x)dx$<br>• $\int_a^a f(x)dx = 0$<br>• $\int_a^b f(x)dx = -\int_b^a f(x)dx$<br>• $\int_a^b f(x)dx + \int_b^c f(x)dx = \int_a^c f(x)dx$<br>• If $f(x) \leq g(x)$ on [a, b], then $\int_a^b f(x)dx \leq \int_a^b g(x)dx$ |
| MA.912.C.4.7 | Understand and use integration by substitution (or change of variable) to find values of integrals. |
| MA.912.C.4.8 | Use Riemann Sums, the Trapezoidal Rule, and technology to approximate definite integrals of functions represented algebraically, geometrically, and by tables of values. |
| MA.912.C.5.1 | Find specific antiderivatives using initial conditions, including finding velocity functions from acceleration functions, finding position functions from velocity functions, and solving applications related to motion along a line. |
| MA.912.C.5.5 | Use definite integrals to find the area between a curve and the x-axis, or between two curves. |

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| MA.912.C.5.7 | Use definite integrals to find the volume of a solid with known cross-sectional area, including solids of revolution. |
| MA.912.C.5.8 | Apply integration to model and solve problems in physical, biological, and social sciences. |

# Pre-Calculus

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| **Course Code** | 1202340 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Pre-Calculus |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Pre-Calculus |

| Scheme | Descriptor |
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| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; |
| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.1112.3.2.2 | The student will draft writing by establishing a logical organizational pattern with supporting details that are substantial, specific, and relevant; and |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and |

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| | oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. |
| MA.912.A.9.1 | Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.). |
| MA.912.A.9.2 | Graph conic sections with and without using graphing technology. |
| MA.912.A.9.3 | Solve real-world problems involving conic sections |
| MA.912.C.1.1 | Understand the concept of limit and estimate limits from graphs and tables of values. |
| MA.912.C.1.2 | Find limits by substitution. |
| MA.912.C.1.3 | Find limits of sums, differences, products, and quotients. |
| MA.912.C.1.4 | Find limits of rational functions that are undefined at a point. |
| MA.912.C.1.5 | Find one-sided limits. |
| MA.912.C.1.9 | Understand continuity in terms of limits. |
| MA.912.C.1.10 | Decide if a function is continuous at a point. |
| MA.912.C.1.11 | Find the types of discontinuities of a function. |
| MA.912.C.1.12 | Understand and use the Intermediate Value Theorem on a function over a closed interval. |
| MA.912.C.1.13 | Understand and apply the Extreme Value Theorem: If f(x) is continuous over a closed interval, then f has a maximum and a minimum on the interval. |
| MA.912.D.1.3 | Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications. |
| MA.912.D.9.1 | Demonstrate an understanding of the geometric interpretation of vectors and vector operations including addition, scalar multiplication, dot product and cross product in the plane and in three-dimensional space. |
| MA.912.D.9.2 | Demonstrate an understanding of the algebraic interpretation of vectors and vector operations including addition, scalar multiplication, dot product and cross product in the plane and in three-dimensional space. |
| MA.912.D.9.3 | Use vectors to model and solve application problems. |
| MA.912.D.10.1 | Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion. |
| MA.912.D.10.2 | Convert from a parametric representation of a plane curve to a rectangular equation, and vice-versa. |
| MA.912.D.10.3 | Use parametric equations to model applications of motion in the plane. |
| MA.912.D.11.4 | Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable. |
| MA.912.T.1.1 | Convert between degree and radian measures. |
| MA.912.T.1.2 | Define and determine sine and cosine using the unit circle. |
| MA.912.T.1.3 | State and use exact values of trigonometric functions for special angles, i.e. multiples of $\frac{\pi}{6}$ and $\frac{\pi}{4}$ (degree and radian measures) |
| MA.912.T.1.4 | Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology. |
| MA.912.T.1.5 | Make connections between right triangle ratios, trigonometric functions, and circular functions. |

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| MA.912.T.1.6 | Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology. |
| MA.912.T.1.7 | Define and graph inverse trigonometric relations and functions. |
| MA.912.T.1.8 | Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |
| MA.912.T.2.2 | Solve real-world problems involving right triangles using technology when appropriate. |
| MA.912.T.2.3 | Apply the laws of sines and cosines to solve real-world problems using technology. |
| MA.912.T.2.4 | Use the area of triangles given two sides and an angle or three sides to solve real-world problems. |
| MA.912.T.3.1 | Verify the basic Pythagorean identities, e.g., $sin^2x + cos^2x = 1$, and show they are equivalent to the Pythagorean Theorem. |
| MA.912.T.3.2 | Use basic trigonometric identities to verify other identities and simplify expressions. |
| MA.912.T.3.3 | Use the sum and difference, half-angle and double-angle formulas for sine, cosine, and tangent, when formulas are provided. |
| MA.912.T.3.4 | Solve trigonometric equations and real-world problems involving applications of trigonometric equations using technology when appropriate. |
| MA.912.T.4.1 | Define polar coordinates and relate polar coordinates to Cartesian coordinates with and without the use of technology. |
| MA.912.T.4.2 | Represent equations given in rectangular coordinates in terms of polar coordinates. |
| MA.912.T.4.3 | Graph equations in the polar coordinate plane with and without the use of graphing technology. |
| MA.912.T.4.4 | Define the trigonometric form of complex numbers, convert complex numbers to trigonometric form, and multiply complex numbers in trigonometric form. |
| MA.912.T.4.5 | Apply DeMoivre's Theorem to perform operations with complex numbers. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1)<br><br>MA.912.T.2.In.b Identify and construct right triangles to solve real-world problems. (2.2) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1)<br><br>MA.912.T.2.Su.b Use right triangles to solve real-world problems. (2.2) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Applied Mathematics 1

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| **Course Code** | 1205400 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Applied Mathematics 1 |
| **Course Level** | 2 |
| **Course Length** | Full year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Applied Mathematics 1 |

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.2.3 | Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.4 | Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution. |
| MA.912.A.3.5 | Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities. |
| MA.912.A.3.7 | Rewrite equations of a line into slope-intercept form and standard form. |
| MA.912.A.3.8 | Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form . |
| MA.912.A.3.9 | Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |

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| MA.912.A.3.11 | Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change. |
| MA.912.A.3.12 | Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.D.7.1 | Perform set operations such as union and intersection, and complement. |
| MA.912.D.7.2 | Use Venn diagrams to explore relationships and patterns, and to make arguments about relationships between sets. |
| MA.912.G.1.1 | Find the lengths and midpoints of line segments in two-dimensional coordinate systems. |
| MA.912.G.1.4 | Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines. |
| MA.912.G.2.3 | Use properties of congruent and similar polygons to solve mathematical or real-world problems. |
| MA.912.G.2.4 | Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons. |
| MA.912.G.3.1 | Describe, classify, and compare relationships among the quadrilaterals the square, rectangle, rhombus, parallelogram, trapezoid, and kite. |
| MA.912.G.4.4 | Use properties of congruent and similar triangles to solve problems involving lengths and areas. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph. (2.3) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4) | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and |

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| MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | (3.1, 3.4)<br><br>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.D.7.In.a Identify and sort elements in two sets, combine the sets to identify elements in either set to form a union, and identify the elements | MA.912.D.7.Su.a Sort elements into two sets and combine elements in either set to form a union using physical and visual | MA.912.D.7.Pa.a Sort the common element from two sets of objects. (7.1, 7.2) |

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| that are in both sets (intersection) using physical and visual models. (7.1)<br><br>MA.912.D.7.In.b Use Venn diagrams to represent the elements in both sets (intersection) of two sets. (7.2) | models. (7.1)<br><br>MA.912.D.7.Su.b Use physical models to identify elements from both sets that belong together (intersection). (7.2) | |
| MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations. (1.1)<br><br>MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers. (1/4) | MA.912.G.1.Su.a Determine the midpoint of a line. (1.1)<br><br>MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid. (1.4) | MA.912.G.1.Pa.a Recognize the ends and middle of a line. (1.1)<br><br>MA.912.G.1.Pa.c Solve real-world problems involving points, lines, angles, and areas (planes) using directional and positional language. (1.4) |
| MA.912.G.2.In.c Identify triangles and rectangles that are the same shape and size (congruent) and same shape but not same size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.In.d Use physical and visual models to show that a change in orientation, such as turns (rotations), slides (translations), and flips (reflections), does not change the size or shape of a polygon. (2.4) | MA.912.G.2.Su.c Match triangles and rectangles that are the same shape, but different size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.Su.d Match identical polygons in different positions, including turns (rotations), slides (translations), and flips (reflections) using physical models. (2.4) | MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature in real-world situations. (2.3, 2.4, 2.6) |
| MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models. (3.1, 3.2) | MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models. (3.1, 3.2) | MA.912.G.3.Pa.a Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) in real-world situations. (3.1) |
| MA.912.G.4.In.c Measure sides and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar). (4.4, 4.6) | MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent). (4.4, 4.6) | MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, 4.7) |

# Applied Mathematics 2

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| **Course Code** | 1205410 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Applied Mathematics 2 |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Applied Mathematics |

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.1.8 | Use the zero product property of real numbers in a variety of contexts to identify solutions to equations. |
| MA.912.A.3.13 | Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |
| MA.912.A.4.2 | Add, subtract, and multiply polynomials. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.5.1 | Simplify algebraic ratios. |
| MA.912.A.5.4 | Solve algebraic proportions. |
| MA.912.A.6.1 | Simplify radical expressions |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.7.1 | Graph quadratic equations with and without graphing technology. |
| MA.912.A.7.2 | Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula. |
| MA.912.A.7.8 | Use quadratic equations to solve real-world problems. |
| MA.912.A.7.10 | Use graphing technology to find approximate solutions of quadratic equations. |

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| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.G.2.5 | Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.). |
| MA.912.G.5.3 | Use special right triangles (30° - 60°- 90° and 45° - 45°- 90°) to solve problems. |
| MA.912.G.5.4 | Solve real-world problems involving right triangles. |
| MA.912.G.6.5 | Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors. |
| MA.912.G.7.5 | Explain and use formulas for lateral area, surface area, and volume of solids. |
| MA.912.G.7.7 | Determine how changes in dimensions affect the surface area and volume of common geometric solids. |
| MA.912.S.2.1 | Compare the difference between surveys, experiments, and observational studies, and what types of questions can and cannot be answered by a particular design. |
| MA.912.S.2.2 | Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses. |
| MA.912.S.2.3 | Identify sources of bias, including sampling and nonsampling errors. |
| MA.912.S.3.9 | Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14) |

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| MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |
| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1)<br><br>MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication. (4.2)<br><br>MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1)<br><br>MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations. (4.2)<br><br>MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1)<br><br>MA.912.A.4.Pa.b Recognize that joining sets of objects results in a larger quantity and separating sets of objects results in a smaller quantity. (4.2)<br><br>MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.5.In.a Use numbers to represent ratios in real-world situations. (5.1)<br><br>MA.912.A.5.In.b Solve problems involving ratios in real-world situations. (5.4) | MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems. (5.1, 5.4) | MA.912.A.5.Pa.a Identify a simple ratio, such as 1 to 2, to solve real-world problems. (5.1, 5.4) |
| MA.912.A.6.In.a Identify perfect squares and their factors, including 1, 4, 9, 16, 25, 49, 64, 100, and 144, using visual models. (6.1)<br><br>MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |

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| MA.912.A.7.In.a Use information from tables and visual models to plot numbers on a line graph representing real-world situations. (7.1)<br><br>MA.912.A.7.In.b Compare quantities from real-world situations represented on a graph and explain similarities and differences. (7.2)<br><br>MA.912.A.7.In.c Use equations involving addition, subtraction, multiplication, and division of whole numbers to solve real-world problems. (7.8) | MA.912.A.7.Su.a Identify information from tables and simple line graphs representing real-world situations. (7.1)<br><br>MA.912.A.7.Su.b Compare quantities from similar real-world situations represented on a graph. (7.2)<br><br>MA.912.A.7.Su.c Solve number sentences (equations) using visual and physical models representing real-world situations. (7.8) | MA.912.A.7.Pa.a Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which groups have more or less. (7.1, 7.2)<br><br>MA.912.A.7.Pa.b Solve problems by joining or separating quantities to 10 using objects, pictures, or symbols. (7.8) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems. (2.5) | MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models. (2.5)<br><br>MA.912.G.2.Su.f Solve real-world problems to find the area of a rectangle to identify total square units using visual models. (2.5) | MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons in real-world situations. (2.5, 2.7) |

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| MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models. (5.3) | MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment. (5.3) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.6.In.b Measure the diameter and radius of circles to solve real-world problems. (6.5) | MA.912.G.6.Su.b Compare the circumference and diameter of circles in real-world situations. (6.5) | MA.912.G.6.Pa.b Match two or more objects with a circle based on a given feature, such as size of the distance around the outside (circumference) or inside (area), in real-world situations. (6.4, 6.5) |
| MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height. (7.5)<br><br>MA.912.G.7.In.e Identify the effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models. (7.7) | MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations (7.5, 7.6)<br><br>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models. (7.7) | MA.912.G.7.Pa.b Match two or more objects with three-dimensional solids based on a given feature, such as the number of faces or overall size, in real-world situations. (7.4, 7.5, 7.6, 7.7) |
| MA.912.S.2.In.a Identify when data from part of a group (sample) should not be used to make predictions regarding the whole group. (2.3) | MA.912.S.2.Su.a Identify problems with inaccurate counting when collecting data and use strategies to correct mistakes. (2.3) | MA.912.S.2.Pa.a Identify a missing part of objects, pictures, or symbols in real-world situations. (2.3) |

# Consumer Mathematics

**Course Code** 1205370
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Elective
**Course Title** Consumer Mathematics
**Course Level**
**Course Length** 1/Y
**Credit Description** 1

**Abbreviated Title** Consumer Mathematics

| Scheme | Descriptor |
|---|---|
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| MA.6.A.1.3 | Solve real-world problems involving multiplication and division of fractions and decimals. |
| MA.6.A.3.1 | Write and evaluate mathematical expressions that correspond to given situations. |
| MA.6.A.3.4 | Solve problems given a formula. |
| MA.6.A.5.1 | Use equivalent forms of fractions, decimals, and percents to solve problems. |
| MA.6.A.5.3 | Estimate the results of computations with fractions, decimals, and percents and judge the reasonableness of the results. |
| MA.6.S.6.1 | Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data. |
| MA.7.A.1.2 | Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease. |
| MA.7.G.4.4 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems. |
| MA.8.A.6.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real world problems. |
| MA.912.F.1.1 | Explain the difference between simple and compound interest. |
| MA.912.F.1.2 | Solve problems involving compound interest. |
| MA.912.F.2.1 | Calculate the future value of a given amount of money, with and without technology. |
| MA.912.F.3.1 | Compare the advantages and disadvantages of using cash versus a credit card. |
| MA.912.F.3.3 | Calculate the finance charges and total amount due on a credit card bill. |
| MA.912.F.3.9 | Calculate the total amount to be paid over the life of a fixed rate loan. |
| MA.912.F.3.13 | Calculate the total amount paid for the life of a loan for a house including the down payment, points, fees, and interest. |
| MA.912.F.3.17 | Compare interest rate calculations and annual percentage rate calculations to distinguish between the two rates. |
| MA.912.F.4.1 | Develop personal budgets that fit within various income brackets. |
| MA.912.F.4.2 | Explain cash management strategies including debit accounts, checking accounts, and savings accounts. |
| MA.912.T.5.1 | Use a variety of problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards, using technology when appropriate. |
| MA.912.T.5.2 | Decide whether a solution is reasonable in the context of the original situation. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.6.A.1.In.d Solve real-world problems involving fractions, including halves, fourths, thirds, and eighths. (1.3) | MA.6.A.1.Su.d Solve real-world problems involving fractions, including halves, fourths, and thirds using real objects or visual or physical models. (1.3) | MA.6.A.1.Pa.b Solve simple problems involving joining and separating parts of a set or parts of a whole. (1.3) |
| MA.6.A.3.In.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with two-digit numbers. (3.1)<br><br>MA.6.A.3.In.e Solve addition and subtraction number sentences (equations) using information from physical models, diagrams, and tables. (3.4, 3.6) | MA.6.A.3.Su.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit numbers. (3.1)<br><br>MA.6.A.3.Su.e Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit numbers. (3.4, 3.6) | MA.6.A.3.Pa.a Solve simple problems involving small quantities using language, such as more, less, same, and none. (3.1, 3.2, 3.6)<br><br>MA.6.A.3.Pa.b Identify quantity in sets of objects to 6 and add 1 more. (3.3, 3.4) |
| MA.6.A.5.In.a Express, represent, and use whole numbers to 200 in various contexts. (5.1)<br><br>MA.6.A.5.In.b Identify the value of money to $2.00 expressed as a decimal. (5.1)<br><br>MA.6.A.5.In.d Solve two-step real-world problems involving addition and subtraction of two-digit numbers and check for accuracy using the reverse operation. (5.3)<br><br>MA.6.A.5.In.e Use a grouping strategy or place value to round to the nearest ten to determine a reasonable estimate in problem situations involving whole numbers to 100, and check for accuracy. (5.3) | MA.6.A.5.Su.a Express, represent, and use whole numbers to 50 using objects, pictures, number names, and numerals, in various contexts. (5.1)<br><br>MA.6.A.5.Su.b Identify the value of coins to $.50 expressed as a decimal. (5.1)<br><br>MA.6.A.5.Su.d Solve real-world problems involving addition and subtraction with sums to 50 using strategies such as representing and grouping objects or tallies. (5.3)<br><br>MA.6.A.5.Su.e Apply the concepts of counting and grouping to identify the value of whole numbers to 50. (5.3) | MA.6.A.5.Pa.a Match two or more sets of objects to 6 using one-to-one correspondence. (5.1)<br><br>MA.6.A.5.Pa.c Solve simple problems involving joining or separating sets of objects to 6. (5.3) |

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| MA.6.S.6.In.a Identify the categories with the largest and smallest numbers represented on a bar graph. (6.1, 6.2) | MA.6.S.6.Su.a Identify the category with the largest number in a pictograph representing real-world situations. (6.1, 6.2) | MA.6.S.6.Pa.a Identify the largest set of objects, pictures, or symbols to 6 representing data in an object graph or pictograph. (6.1, 6.2) |
| MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems. (1.2) | MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations. (1.2) | MA.7.A.1.Pa.b Match objects to a model or picture that is a smaller version. (1.2, 1.3, 1.4, 1.5, 1.6) |
| MA.7.G.4.In.d Use tools, such as charts and technology, to convert measures of capacity, including cups, pints, quarts, and gallons. (4.4) | MA.7.G.4.Su.d Use tools, such as a chart, to identify the number of cups in a pint and quart to convert measures of capacity. (4.4) | MA.7.G.4.Pa.d Identify similarities and differences in features of objects, such as shape and size. (4.4) |
| MA.8.A.6.In.c Express, represent, and use fractions—including halves, fourths, thirds, eighths, and sixths—using whole objects or sets, number names, and numerals in various contexts. (6.4) | MA.8.A.6.Su.c Express, represent, and use fractions—such as halves, fourths, and thirds—using whole objects or sets, pictures, number names, and numerals in various contexts. (6.4) | MA.8.A.6.Pa.c Recognize half and whole of sets of objects to 8. (6.4) |
| MA.8.A.6.In.d Express, represent, and use percents—including 25%, 50%, 75%, and 100%—and decimals in the context of money. (6.4) | MA.8.A.6.Su.d Identify percents including 50% and 100%, and values of coins and bills written as a decimal. (6.4) | |
| MA.912.F.1.In.a Identify interest on a loan or credit card as money charged for borrowing money. (1.1) | MA.912.F.1.Su.a Identify interest as extra money charged when borrowing money. (1.1) | MA.912.F.1.Pa.a Recognize that some items cost more than others. (1.1, 1.2, 1.3) |
| MA.912.F.1.In.b Identify interest on a savings account as money earned by keeping money in the account over time. (1.1, 1.2) | MA.912.F.1.Su.b Identify interest on a savings account as money earned by keeping money in the account. (1.1, 1.2) | |
| | MA.912.F.1.Su.c Identify interest rates used in real-world situations. (1.1, 1.2, 1.3) | |
| MA.912.F.2.In.a Identify situations that affect cost of living, such as inflation, wages, and location. (2.1) | MA.912.F.2.Su.a Identify examples of costs that have changed over time. (2.1) | MA.912.F.2.Pa.a Recognize that the cost of some items can change. (2.1) |

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| MA.912.F.3.In.a Identify wise consumer strategies for cash purchases, such as counting change, rounding up, and adding the tax. (3.1)<br><br>MA.912.F.3.In.b Identify advantages and disadvantages of using alternate forms of payment, such as checks, gift cards, debit cards, and credit cards. (3.1)<br><br>MA.912.F.3.In.c Identify finance charges as extra amounts added to cost of items that are not paid for on time. (3.3) | MA.912.F.3.Su.a Identify wise consumer strategies for paying with cash, such as rounding to the next dollar. (3.1)<br><br>MA.912.F.3.Su.b Identify examples of alternate forms of payment, including debit cards, checks, gift cards, and credit cards. (3.1) | MA.912.F.3.Pa.a Recognize that a predetermined amount of money can be used to pay for an item in common purchasing situations. (3.1, 3.3, 3.4, 3.6, 3.7) |
| MA.912.F.4.In.a Create a personal budget that fits take-home income after taxes. (4.1)<br><br>MA.912.F.4.In.b Use real-world strategies needed to manage personal income. (4.2)<br><br>MA.912.F.4.In.c Identify differences in methods for saving money, such as a savings account, money market account, or savings bonds. (4.2)<br><br>MA.912.F.4.In.e Identify reliable sources to assist with personal money management, tax preparation, and financial decisions. (4.2) | MA.912.F.4.Su.a Distinguish between income and expenses. (4.1)<br><br>MA.912.F.4.Su.b Identify a personal budget that fits take-home income after taxes. (4.1)<br><br>MA.912.F.4.Su.c Identify a method for saving money, such as a savings account. (4.2)<br><br>MA.912.F.4.Su.e Identify reliable sources of assistance for personal money management and financial decisions. (4.2) | MA.912.F.4.Pa.a Identify common items or services that have a cost. (4.1, 4.2, 4.5, 4.6) |

# Explorations in Mathematics 1

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| **Course Code** | 1205500 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Elective |
| **Course Title** | Explorations in Mathematics 1 |
| **Course Level** | 1 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Explorations in Mathematics 1 |

| Scheme | Descriptor |
|---|---|
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| MA.4.G.5.2 | Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry. |
| MA.6.A.1.1 | Explain and justify procedures for multiplying and dividing fractions and decimals. |
| MA.6.A.1.2 | Multiply and divide fractions and decimals efficiently. |
| MA.6.A.1.3 | Solve real-world problems involving multiplication and division of fractions and decimals. |
| MA.6.A.2.1 | Use reasoning about multiplication and division to solve ratio and rate problems. |
| MA.6.A.2.2 | Interpret and compare ratios and rates. |
| MA.6.A.3.3 | Works backward with two-step function rules to undo expressions. |
| MA.6.A.3.4 | Solve problems given a formula. |
| MA.6.A.3.6 | Construct and analyze tables, graphs and equations to describe linear functions and other simple relationships, including a discussion of slope as the rate of change without the use of the slope formula relations using both common language and algebraic notation. |
| MA.6.S.6.1 | Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data. |
| MA.7.A.1.2 | Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease. |
| MA.7.A.3.2 | Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts. |
| MA.7.A.5.1 | Express rational numbers as terminating or repeating decimals. |
| MA.7.G.4.3 | Identify and plot ordered pairs in all four quadrants of the coordinate plane. |
| MA.912.G.2.1 | Identify and describe convex, concave, regular, and irregular polygons. |
| MA.912.G.4.1 | Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular. |
| MA.912.T.5.1 | Use a variety of problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards, using technology when appropriate. |
| MA.912.T.5.2 | Decide whether a solution is reasonable in the context of the original situation. |

| Access Points for Students with Significant Cognitive Disabilities | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.4.G.5.In.b Identify examples of two-dimensional figures that are the same shape and size (congruency) and figures that are visually the same on both sides of a central dividing line (symmetry) in the environment. (5.2) | MA.4.G.5.Su.b Identify two-dimensional figures that are visually the same on both sides of a central dividing line (symmetry). (5.2) | MA.4.G.5.Pa.b Recognize the two sides of a two-dimensional figure created by a central dividing line (symmetry) (5.2) |
| MA.6.A.1.In.a Express and represent fractions, including halves, fourths, thirds, and eighths, using number names and numerals. (1.1)<br><br>MA.6.A.1.In.b Identify multiplication as repeated addition of equal groups and multiply one-digit numbers using physical and visual models with numerals. (1.2)<br><br>MA.6.A.1.In.c Identify division as repeated subtraction of equal groups and divide one-digit numbers using physical and visual models with numerals. (1.2)<br><br>MA.6.A.1.In.d Solve real-world problems involving fractions, including halves, fourths, thirds, and eighths. (1.3) | MA.6.A.1.Su.a Express, represent, and use fractions including halves, fourths, and thirds, as parts of a whole and as parts of a set using number names. (1.1)<br><br>MA.6.A.1.Su.b Combine (multiply) equal sets with quantities to 30 using objects and pictures with numerals. (1.2)<br><br>MA.6.A.1.Su.c Use counting and grouping to separate (divide) quantities to 30 into sets with the same number using objects or pictures. (1.2)<br><br>MA.6.A.1.Su.d Solve real-world problems involving fractions, including halves, fourths, and thirds using real objects or visual or physical models. (1.3) | MA.6.A.1.Pa.a Recognize part (half) of sets of objects to 4. (1.1, 1.2)<br><br>MA.6.A.1.Pa.b Solve simple problems involving joining and separating parts of a set or parts of a whole. (1.3) |
| MA.6.A.2.In.a Identify the meaning of common uses of ratio, such as equivalent fractions and mixtures. (2.1)<br><br>MA.6.A.2.In.b Identify two meanings of rate: a measure of speed, including miles per hour and words per minute; and a measure of cost, including price per gallon and cost per pound. (2.2) | MA.6.A.2.Su.a Recognize the meaning of a simple ratio, such as 2 to 1. (2.1)<br><br>MA.6.A.2.Su.b Identify one meaning of rate, including how fast something moves or happens. (2.2) | MA.6.A.2.Pa.a Recognize differences in quantity in two sets of objects to 6. (2.1)<br><br>MA.6.A.2.Pa.b Recognize changes in rates of movement (fast and slow). (2.2) |

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| MA.6.A.3.In.c Identify function rules with addition and subtraction of one-digit numbers represented in number pairs, such as +5, - 4, or +3. (3.3)<br><br>MA.6.A.3.In.e Solve addition and subtraction number sentences (equations) using information from physical models, diagrams, and tables. (3.4, 3.6) | MA.6.A.3.Su.c Identify function rules of 1 more and 1 less represented in number pairs, such as 5 is 1 more than 4 and 3 is 1 less than 4. (3.3)<br><br>MA.6.A.3.Su.e Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit numbers. (3.4, 3.6) | MA.6.A.3.Pa.a Solve simple problems involving small quantities using language, such as more, less, same, and none. (3.1, 3.2, 3.6)<br><br>MA.6.A.3.Pa.b Identify quantity in sets of objects to 6 and add 1 more. (3.3, 3.4)<br><br>MA.6.A.3.Pa.c Determine if the quantity in two sets of objects to 6 is the same or different. (3.5, 3.6) |
| MA.6.S.6.In.a Identify the categories with the largest and smallest numbers represented on a bar graph. (6.1, 6.2) | MA.6.S.6.Su.a Identify the category with the largest number in a pictograph representing real-world situations. (6.1, 6.2) | MA.6.S.6.Pa.a Identify the largest set of objects, pictures, or symbols to 6 representing data in an object graph or pictograph. (6.1, 6.2) |
| MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems. (1.2) | MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations. (1.2) | MA.7.A.1.Pa.b Match objects to a model or picture that is a smaller version. (1.2, 1.3, 1.4, 1.5, 1.6) |
| MA.7.A.3.In.a Solve number sentences (equations) involving addition and subtraction of numbers to 500. (3.1, 3.2)<br><br>MA.7.A.3.In.b Solve number sentences involving multiplication and division facts. (3.1, 3.2) | MA.7.A.3.Su.a Add and subtract one-digit and two-digit number sentences (equations). (3.1, 3.2)<br><br>MA.7.A.3.Su.b Solve problems that involve combining (multiplying) or separating (dividing) equal sets with quantities to 50 using objects and pictures with numerals. (3.1, 3.2) | MA.7.A.3.Pa.a Solve simple problems involving joining or separating sets of objects to 7. (3.1, 3.2) |
| MA.7.A.5.In.a Express, represent, and use percents, including 50% and 100%, and decimals in the context of money to $5.00 or more. (5.1) | MA.7.A.5.Su.a Identify the value of money to $1.00 written as a decimal. (5.1) | MA.7.A.5.Pa.a Express and use quantities 1 to 7 using objects, pictures, symbols, or number names. (5.1) |
| MA.7.G.4.In.c Identify common uses of a coordinate plane, such as a map or line graph. (4.3) | MA.7.G.4.Su.c Recognize a common use of a coordinate plane, such as a map. (4.3) | MA.7.G.4.Pa.c Solve problems using directional or positional language, such as up, down, left, right, and next to. (4.3) |

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| MA.912.G.2.In.a Determine if polygons have all sides and angles equal (regular) or have sides or angles that are not equal (irregular) using physical and visual models. (2.1) | MA.912.G.2.Su.a Identify polygons with all sides and angles equal (regular) in the environment. (2.1) | MA.912.G.2.Pa.a Identify objects or pictures with polygons. (2.1, 2.2) |
| MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual and physical models. (4.1, 4.7) | MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models. (4.1, 4.2, 4.5, 4.7) | MA.912.G.4.Pa.a Identify objects, pictures, or signs with a triangle in real-world situations. (4.1, 4.5) |

# Business Mathematics

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| **Course Code** | 1205540 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Elective |
| **Course Title** | Business Mathematics |
| **Course Level** | |
| **Course Length** | 1/Y |
| **Credit Description** | 1 |
| **Abbreviated Title** | Business Mathematics |

| Scheme | Descriptor |
|---|---|
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| MA.6.A.1.3 | Solve real-world problems involving multiplication and division of fractions and decimals. |
| MA.6.A.3.1 | Write and evaluate mathematical expressions that correspond to given situations. |
| MA.6.A.3.4 | Solve problems given a formula. |
| MA.6.A.5.1 | Use equivalent forms of fractions, decimals, and percents to solve problems. |
| MA.6.A.5.3 | Estimate the results of computations with fractions, decimals, and percents and judge the reasonableness of the results. |
| MA.6.S.6.1 | Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data. |
| MA.7.A.1.2 | Solve percent problems, including problems involving discounts, simple interest, taxes, |

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| | tips and percents of increase or decrease. |
| MA.7.G.4.1 | Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and apply these relationships to solve problems. |
| MA.7.G.4.4 | Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems. |
| MA.8.A.6.1 | Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems. |
| MA.8.A.6.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real world problems. |
| MA.8.S.3.1 | Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships. |
| MA.912.F.1.1 | Explain the difference between simple and compound interest. |
| MA.912.F.1.2 | Solve problems involving compound interest. |
| MA.912.F.2.1 | Calculate the future value of a given amount of money, with and without technology. |
| MA.912.F.2.2 | Calculate the present value of a certain amount of money for a given length of time in the future, with and without technology. |
| MA.912.F.3.1 | Compare the advantages and disadvantages of using cash versus a credit card. |
| MA.912.F.3.3 | Calculate the finance charges and total amount due on a credit card bill. |
| MA.912.F.3.6 | Calculate total cost of purchasing consumer durables over time given different down payments, financing options, and fees. |
| MA.912.F.4.2 | Explain cash management strategies including debit accounts, checking accounts, and savings accounts. |
| MA.912.F.4.5 | Develop and apply a variety of strategies to use tax tables, determine, calculate, and complete yearly federal income tax |
| MA.912.F.4.11 | Purchase stock with a set amount of money and follow the process through gains, losses, and selling |
| MA.912.F.4.13 | Given current exchange rates be able to convert from one form of currency to another. |
| MA.912.F.5.1 | Demonstrate how price and quantity demanded relate, how price and quantity supplied relate, and how price changes or price controls affect distribution and allocation in the economy. |

| Access Points for Students with Significant Cognitive Disabilities | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.6.A.1.In.d Solve real-world problems involving fractions, including halves, fourths, thirds, and eighths. (1.3) | MA.6.A.1.Su.d Solve real-world problems involving fractions, including halves, fourths, and thirds using real objects or visual or physical models. (1.3) | MA.6.A.1.Pa.b Solve simple problems involving joining and separating parts of a set or parts of a whole. (1.3) |
| MA.6.A.3.In.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with two-digit numbers. (3.1)<br><br>MA.6.A.3.In.e Solve addition and subtraction number sentences (equations) using information from physical models, diagrams, and tables. (3.4, 3.6) | MA.6.A.3.Su.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit numbers. (3.1)<br><br>MA.6.A.3.Su.e Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit numbers. (3.4, 3.6) | MA.6.A.3.Pa.a Solve simple problems involving small quantities using language, such as more, less, same, and none. (3.1, 3.2, 3.6)<br><br>MA.6.A.3.Pa.b Identify quantity in sets of objects to 6 and add 1 more. (3.3, 3.4) |
| MA.6.A.5.In.a Express, represent, and use whole numbers to 200 in various contexts. (5.1)<br><br>MA.6.A.5.In.b Identify the value of money to $2.00 expressed as a decimal. (5.1)<br><br>MA.6.A.5.In.d Solve two-step real-world problems involving addition and subtraction of two-digit numbers and check for accuracy using the reverse operation. (5.3)<br><br>MA.6.A.5.In.e Use a grouping strategy or place value to round to the nearest ten to determine a reasonable estimate in problem situations involving whole numbers to 100, and check for accuracy. (5.3) | MA.6.A.5.Su.a Express, represent, and use whole numbers to 50 using objects, pictures, number names, and numerals, in various contexts. (5.1)<br><br>MA.6.A.5.Su.b Identify the value of coins to $.50 expressed as a decimal. (5.1)<br><br>MA.6.A.5.Su.d Solve real-world problems involving addition and subtraction with sums to 50 using strategies such as representing and grouping objects or tallies. (5.3)<br><br>MA.6.A.5.Su.e Apply the concepts of counting and grouping to identify the value of whole numbers to 50. (5.3) | MA.6.A.5.Pa.a Match two or more sets of objects to 6 using one-to-one correspondence. (5.1)<br><br>MA.6.A.5.Pa.c Solve simple problems involving joining or separating sets of objects to 6. (5.3) |

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| MA.6.S.6.In.a Identify the categories with the largest and smallest numbers represented on a bar graph. (6.1, 6.2) | MA.6.S.6.Su.a Identify the category with the largest number in a pictograph representing real-world situations. (6.1, 6.2) | MA.6.S.6.Pa.a Identify the largest set of objects, pictures, or symbols to 6 representing data in an object graph or pictograph. (6.1, 6.2) |
| MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems. (1.2) | MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations. (1.2) | MA.7.A.1.Pa.b Match objects to a model or picture that is a smaller version. (1.2, 1.3, 1.4, 1.5, 1.6) |
| MA.7.G.4.In.a Identify the effects of changes in the lengths of sides of rectangles on the perimeter and area using physical and visual models. (4.1)<br><br>MA.7.G.4.In.d Use tools, such as charts and technology, to convert measures of capacity, including cups, pints, quarts, and gallons. (4.4) | MA.7.G.4.Su.a Recognize that changes in the lengths of sides of rectangles will make the figure or object smaller or larger. (4.1)<br><br>MA.7.G.4.Su.d Use tools, such as a chart, to identify the number of cups in a pint and quart to convert measures of capacity. (4.4) | MA.7.G.4.Pa.a Match two- and three-dimensional objects with the same shape but different size. (4.1)<br><br>MA.7.G.4.Pa.d Identify similarities and differences in features of objects, such as shape and size. (4.4) |
| MA.8.A.6.In.a Express, represent, and use whole numbers to 1000 in various contexts. (6.1)<br><br>MA.8.A.6.In.c Express, represent, and use fractions—including halves, fourths, thirds, eighths, and sixths—using whole objects or sets, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.In.d Express, represent, and use percents—including 25%, 50%, 75%, and 100%—and decimals in the context of money. (6.4) | MA.8.A.6.Su.a Express, represent, and use whole numbers to 100 in various contexts. (6.1)<br><br>MA.8.A.6.Su.c Express, represent, and use fractions—such as halves, fourths, and thirds—using whole objects or sets, pictures, number names, and numerals in various contexts. (6.4)<br><br>MA.8.A.6.Su.d Identify percents including 50% and 100%, and values of coins and bills written as a decimal. (6.4) | MA.8.A.6.Pa.a Identify quantity in sets to 8 using objects, pictures, symbols, or number names. (6.1).<br><br>MA.8.A.6.Pa.c Recognize half and whole of sets of objects to 8. (6.4) |
| MA.8.S.3.In.a Organize data into categories, identify the labels, and display in bar and simple line graphs. (3.1) | MA.8.S.3.Su.a Organize data in pictographs and match the labels for categories. (3.1) | MA.8.S.3.Pa.a Count objects, pictures, or symbols used in a pictograph or table and identify a total to 8. (3.1, 3.2) |

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| MA.912.F.1.In.a Identify interest on a loan or credit card as money charged for borrowing money. (1.1)<br><br>MA.912.F.1.In.b Identify interest on a savings account as money earned by keeping money in the account over time. (1.1, 1.2) | MA.912.F.1.Su.a Identify interest as extra money charged when borrowing money. (1.1)<br><br>MA.912.F.1.Su.b Identify interest on a savings account as money earned by keeping money in the account. (1.1, 1.2)<br><br>MA.912.F.1.Su.c Identify interest rates used in real-world situations. (1.1, 1.2, 1.3) | MA.912.F.1.Pa.a Recognize that some items cost more than others. (1.1, 1.2, 1.3) |
| MA.912.F.2.In.a Identify situations that affect cost of living, such as inflation, wages, and location. (2.1) | MA.912.F.2.Su.a Identify examples of costs that have changed over time. (2.1) | MA.912.F.2.Pa.a Recognize that the cost of some items can change. (2.1) |
| MA.912.F.3.In.a Identify wise consumer strategies for cash purchases, such as counting change, rounding up, and adding the tax. (3.1)<br><br>MA.912.F.3.In.b Identify advantages and disadvantages of using alternate forms of payment, such as checks, gift cards, debit cards, and credit cards. (3.1)<br><br>MA.912.F.3.In.c Identify finance charges as extra amounts added to cost of items that are not paid for on time. (3.3)<br><br>MA.912.F.3.In.e Identify reasons for paying bills on time and the effects of late payments or nonpayment.(3.6) | MA.912.F.3.Su.a Identify wise consumer strategies for paying with cash, such as rounding to the next dollar. (3.1)<br><br>MA.912.F.3.Su.b Identify examples of alternate forms of payment, including debit cards, checks, gift cards, and credit cards. (3.1)<br><br>MA.912.F.3.Su.c Identify the effects of not paying bills on time. (3.4, 3.6, 3.7) | MA.912.F.3.Pa.a Recognize that a predetermined amount of money can be used to pay for an item in common purchasing situations. (3.1, 3.3, 3.4, 3.6, 3.7) |

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| MA.912.F.4.In.b Use real-world strategies needed to manage personal income. (4.2)<br><br>MA.912.F.4.In.c Identify differences in methods for saving money, such as a savings account, money market account, or savings bonds. (4.2)<br><br>MA.912.F.4.In.e Identify reliable sources to assist with personal money management, tax preparation, and financial decisions. (4.2)<br><br>MA.912.F.4.In.d Use strategies to determine how much sales and income tax must be paid in real-world situations. (4.5) | MA.912.F.4.Su.b Identify a personal budget that fits take-home income after taxes. (4.1)<br><br>MA.912.F.4.Su.c Identify a method for saving money, such as a savings account. (4.2)<br><br>MA.912.F.4.Su.e Identify reliable sources of assistance for personal money management and financial decisions. (4.2)<br><br>MA.912.F.4.Su.d Identify additional charges, such as sales tax and service fees, that may change the original cost of an item. (4.5) | MA.912.F.4.Pa.a Identify common items or services that have a cost. (4.1, 4.2, 4.5, 4.6) |

# Informal Geometry

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| **Course Code** | 1206300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Informal Geometry |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Informal Geometry |

**RELATED BENCHMARKS (37) :**

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.1112.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| MA.912.D.6.2 | Find the converse, inverse, and contrapositive of a statement |
| MA.912.G.1.1 | Find the lengths and midpoints of line segments in two-dimensional coordinate systems. |
| MA.912.G.1.3 | Identify and use the relationships between special pairs of angles formed by parallel lines and transversals. |

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| MA.912.G.2.1 | Identify and describe convex, concave, regular, and irregular polygons. |
| MA.912.G.2.2 | Determine the measures of interior and exterior angles of polygons, justifying the method used. |
| MA.912.G.2.3 | Use properties of congruent and similar polygons to solve mathematical or real-world problems. |
| MA.912.G.2.5 | Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.). |
| MA.912.G.3.1 | Describe, classify, and compare relationships among the quadrilaterals the square, rectangle, rhombus, parallelogram, trapezoid, and kite. |
| MA.912.G.3.2 | Compare and contrast special quadrilaterals on the basis of their properties. |
| MA.912.G.4.1 | Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular. |
| MA.912.G.4.2 | Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors,orthocenter, centroid, incenter, and circumcenter. |
| MA.912.G.4.3 | Construct triangles congruent to given triangles. |
| MA.912.G.4.4 | Use properties of congruent and similar triangles to solve problems involving lengths and areas. |
| MA.912.G.4.5 | Apply theorems involving segments divided proportionally. |
| MA.912.G.4.6 | Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles. |
| MA.912.G.4.7 | Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem. |
| MA.912.G.5.1 | Prove and apply the Pythagorean Theorem and its converse. |
| MA.912.G.5.3 | Use special right triangles (30° - 60°- 90° and 45° - 45°- 90°) to solve problems. |
| MA.912.G.5.4 | Solve real-world problems involving right triangles. |
| MA.912.G.6.2 | Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles. |
| MA.912.G.6.4 | Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents). |
| MA.912.G.6.5 | Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors. |
| MA.912.G.7.1 | Describe and make regular, non-regular, and oblique polyhedra and sketch the net for a given polyhedron and vice versa. |
| MA.912.G.7.2 | Describe the relationships between the faces, edges, and vertices of polyhedra. |
| MA.912.G.7.4 | Identify chords, tangents, radii, and great circles of spheres |
| MA.912.G.7.5 | Explain and use formulas for lateral area, surface area, and volume of solids. |
| MA.912.G.7.7 | Determine how changes in dimensions affect the surface area and volume of common geometric solids. |
| MA.912.G.8.1 | Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates and theorems. |
| MA.912.G.8.2 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards. |
| MA.912.G.8.3 | Determine whether a solution is reasonable in the context of the original situation. |

MA.912.G.8.4 Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.D.6.In.a Determine whether "if, then" statements for common events in real-world situations are true or false. (6.2) | MA.912.D.6.Su.a Use pictures and objects to determine whether statements about common events in real-world situations are true or false. (6.2) | MA.912.D.6.Pa.a Recognize whether the solution to problems involving quantities to 10 in real-world situations is correct or incorrect. (6.2, 6.4, 6.5) |
| MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations. (1.1)<br><br>MA.912.G.1.In.b Locate angles formed when a line intersects two parallel lines and classify the angles as obtuse, acute, or right angles. (1.3) | MA.912.G.1.Su.a Determine the midpoint of a line. (1.1)<br><br>MA.912.G.1.Su.b Differentiate between intersecting and parallel lines. (1.3)<br><br>MA.912.G.1.Su.c Match types of angles, such as obtuse, acute, and right angles, using physical models and drawings. (1.3) | MA.912.G.1.Pa.a Recognize the ends and middle of a line. (1.1)<br><br>MA.912.G.1.Pa.b Recognize angles in two-dimensional shapes. (1.3) |
| MA.912.G.2.In.a Determine if polygons have all sides and angles equal (regular) or have sides or angles that are not equal (irregular) using physical and visual models. (2.1)<br><br>MA.912.G.2.In.b Use tools to measure angles, including 45° and 90°. (2.2)<br><br>MA.912.G.2.In.c Identify triangles and rectangles that are the same shape and size (congruent) and same shape but not same size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems. (2.5) | MA.912.G.2.Su.a Identify polygons with all sides and angles equal (regular) in the environment. (2.1)<br><br>MA.912.G.2.Su.b Use a model of a right triangle to compare the size of angles, such as acute, obtuse, and right angles. (2.2)<br><br>MA.912.G.2.Su.c Match triangles and rectangles that are the same shape, but different size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models. (2.5)<br><br>MA.912.G.2.Su.f Solve real-world problems to find the area of a rectangle to identify total square units using visual models. (2.5) | MA.912.G.2.Pa.a Identify objects or pictures with polygons. (2.1, 2.2)<br><br>MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature in real-world situations. (2.3, 2.4, 2.6)<br><br>MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons in real-world situations. (2.5, 2.7) |

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| MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models. (3.1, 3.2) | MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models. (3.1, 3.2) | MA.912.G.3.Pa.a Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) in real-world situations. (3.1)<br><br>MA.912.G.3.Pa.b Match two or more objects with four-sided shapes (quadrilaterals), based on a given feature, such as length of side or size of the area. (3.2, 3.3) |
| MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual and physical models. (4.1, 4.7)<br><br>MA.912.G.4.In.b Identify the height (altitude) in equilateral and isosceles triangles using physical and visual models. (4.2, 4.5)<br><br>MA.912.G.4.In.c Measure sides and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar). (4.4, 4.6) | MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models. (4.1, 4.2, 4.5, 4.7)<br><br>MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent). (4.4, 4.6) | MA.912.G.4.Pa.a Identify objects, pictures, or signs with a triangle in real-world situations. (4.1, 4.5)<br><br>MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, 4.7) |
| MA.912.G.5.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse). (5.1)<br><br>MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models. (5.3) | MA.912.G.5.Su.a Identify right triangles in the environment using physical models. (5.1)<br><br>MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment. (5.3) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.6.In.a Identify and describe the circumference, arc, diameter, and radius of circles using physical and visual models. (6.2, 6.4)<br><br>MA.912.G.6.In.b Measure the diameter and radius of circles to | MA.912.G.6.Su.a Identify the circumference, arc, and diameter of circles in real-world situations. (6.2, 6.4)<br><br>MA.912.G.6.Su.b Compare the circumference and diameter of circles in real-world situations. | MA.912.G.6.Pa.a Identify objects, pictures, or signs with a circle in real-world situations. (6.2, 6.6)<br><br>MA.912.G.6.Pa.b Match two or more objects with a circle based on a given feature, such as size of the distance around the |

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| solve real-world problems. (6.5) | (6.5) | outside (circumference) or inside (area), in real-world situations. (6.4, 6.5) |
| MA.912.G.7.In.a Identify and describe three-dimensional solids, including sphere, cylinder, rectangular prism, and cone, in the environment using mathematical names. (7.1)<br><br>MA.912.G.7.In.b Identify a line that divides a sphere in half. (7.4)<br><br>MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height. (7.5)<br><br>MA.912.G.7.In.e Identify the effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models. (7.7) | MA.912.G.7.Su.a Identify properties of three-dimensional solids, such as sphere, cylinder, cube, and cone, in the environment, when given the common name. (7.1, 7.4)<br><br>MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations (7.5, 7.6)<br><br>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models. (7.7) | MA.912.G.7.Pa.a Identify objects or pictures with three-dimensional solids in real-world situations. (7.1, 7.6)<br><br>MA.912.G.7.Pa.b Match two or more objects with three-dimensional solids based on a given feature, such as the number of faces or overall size, in real-world situations. (7.4, 7.5, 7.6, 7.7) |
| MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills. (8.3)<br><br>MA.912.G.8.In.b Use estimation and resources to determine if solutions to problems involving geometry concepts and skills are reasonable. (8.4) | MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills. (8.3)<br><br>MA.912.G.8.Su.b Use resources, such as calculators and conversion charts to verify accuracy of solutions to problems involving geometry concepts. (8.4) | MA.912.G.8.Pa.a Solve real-world problems involving objects with two- and three-dimensional shapes and match the result to the correct answer to determine accuracy. (8.3, 8.4) |

# Geometry

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| **Course Code** | 1206310 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Geometry |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |

| **Abbreviated Title** | Geometry |
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| Scheme | Descriptor |
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.1112.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| MA.912.D.6.2 | Find the converse, inverse, and contrapositive of a statement |
| MA.912.D.6.3 | Determine whether two propositions are logically equivalent. |
| MA.912.D.6.4 | Use methods of direct and indirect proof and determine whether a short proof is logically valid. |
| MA.912.G.1.1 | Find the lengths and midpoints of line segments in two-dimensional coordinate systems. |
| MA.912.G.1.2 | Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used. |
| MA.912.G.1.3 | Identify and use the relationships between special pairs of angles formed by parallel lines and transversals. |
| MA.912.G.2.1 | Identify and describe convex, concave, regular, and irregular polygons. |
| MA.912.G.2.2 | Determine the measures of interior and exterior angles of polygons, justifying the method used. |
| MA.912.G.2.3 | Use properties of congruent and similar polygons to solve mathematical or real-world problems. |
| MA.912.G.2.4 | Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons. |
| MA.912.G.2.5 | Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.). |
| MA.912.G.2.7 | Determine how changes in dimensions affect the perimeter and area of common geometric figures. |
| MA.912.G.3.1 | Describe, classify, and compare relationships among the quadrilaterals the square, rectangle, rhombus, parallelogram, trapezoid, and kite. |
| MA.912.G.3.2 | Compare and contrast special quadrilaterals on the basis of their properties. |
| MA.912.G.3.3 | Use coordinate geometry to prove properties of congruent, regular and similar quadrilaterals. |
| MA.912.G.3.4 | Prove theorems involving quadrilaterals. |
| MA.912.G.4.1 | Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular. |
| MA.912.G.4.2 | Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter. |
| MA.912.G.4.3 | Construct triangles congruent to given triangles. |
| MA.912.G.4.4 | Use properties of congruent and similar triangles to solve problems involving lengths |

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| | and areas. |
| MA.912.G.4.5 | Apply theorems involving segments divided proportionally. |
| MA.912.G.4.6 | Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles. |
| MA.912.G.4.7 | Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem. |
| MA.912.G.5.1 | Prove and apply the Pythagorean Theorem and its converse. |
| MA.912.G.5.2 | State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle. |
| MA.912.G.5.3 | Use special right triangles (30° - 60°- 90° and 45° - 45°- 90°) to solve problems. |
| MA.912.G.5.4 | Solve real-world problems involving right triangles. |
| MA.912.G.6.2 | Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles. |
| MA.912.G.6.4 | Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents). |
| MA.912.G.6.5 | Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors. |
| MA.912.G.6.6 | Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle. |
| MA.912.G.6.7 | Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle. |
| MA.912.G.7.1 | Describe and make regular, non-regular, and oblique polyhedra and sketch the net for a given polyhedron and vice versa. |
| MA.912.G.7.2 | Describe the relationships between the faces, edges, and vertices of polyhedra. |
| MA.912.G.7.4 | Identify chords, tangents, radii, and great circles of spheres |
| MA.912.G.7.5 | Explain and use formulas for lateral area, surface area, and volume of solids. |
| MA.912.G.7.6 | Identify and use properties of congruent and similar solids. |
| MA.912.G.7.7 | Determine how changes in dimensions affect the surface area and volume of common geometric solids. |
| MA.912.G.8.1 | Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates and theorems. |
| MA.912.G.8.2 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards. |
| MA.912.G.8.3 | Determine whether a solution is reasonable in the context of the original situation. |
| MA.912.G.8.4 | Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture. |
| MA.912.G.8.5 | Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs. |
| MA.912.G.8.6 | Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing and drawing geometric figures. |

MA.912.T.2.1 Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.D.6.In.a Determine whether "if, then" statements for common events in real-world situations are true or false. (6.2)<br><br>MA.912.D.6.In.b Determine whether two statements have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Su.a Use pictures and objects to determine whether statements about common events in real-world situations are true or false. (6.2)<br><br>MA.912.D.6.Su.b Match two statements that have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Pa.a Recognize whether the solution to problems involving quantities to 10 in real-world situations is correct or incorrect. (6.2, 6.4, 6.5) |
| MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations. (1.1)<br><br>MA.912.G.1.In.b Locate angles formed when a line intersects two parallel lines and classify the angles as obtuse, acute, or right angles. (1.3) | MA.912.G.1.Su.a Determine the midpoint of a line. (1.1)<br><br>MA.912.G.1.Su.b Differentiate between intersecting and parallel lines. (1.3)<br><br>MA.912.G.1.Su.c Match types of angles, such as obtuse, acute, and right angles, using physical models and drawings. (1.3) | MA.912.G.1.Pa.a Recognize the ends and middle of a line. (1.1)<br><br>MA.912.G.1.Pa.b Recognize angles in two-dimensional shapes. (1.3) |
| MA.912.G.2.In.a Determine if polygons have all sides and angles equal (regular) or have sides or angles that are not equal (irregular) using physical and visual models. (2.1)<br><br>MA.912.G.2.In.b Use tools to measure angles, including 45° and 90°. (2.2)<br><br>MA.912.G.2.In.c Identify triangles and rectangles that are the same shape and size (congruent) and same shape but not same size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.In.d Use physical and visual models to show that a | MA.912.G.2.Su.a Identify polygons with all sides and angles equal (regular) in the environment. (2.1)<br><br>MA.912.G.2.Su.b Use a model of a right triangle to compare the size of angles, such as acute, obtuse, and right angles. (2.2)<br><br>MA.912.G.2.Su.c Match triangles and rectangles that are the same shape, but different size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.Su.d Match identical polygons in different positions, including turns (rotations), slides (translations), and flips (reflections) using physical | MA.912.G.2.Pa.a Identify objects or pictures with polygons. (2.1, 2.2)<br><br>MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature in real-world situations. (2.3, 2.4, 2.6)<br><br>MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons in real-world situations. (2.5, 2.7) |

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| change in orientation, such as turns (rotations), slides (translations), and flips (reflections), does not change the size or shape of a polygon. (2.4)<br><br>MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems. (2.5)<br><br>MA.912.G.2.In.f Identify the effects of changes in the lengths of sides on the perimeter and area of rectangles using visual models to solve real-world problems. (2.7) | models. (2.4)<br><br>MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models. (2.5)<br><br>MA.912.G.2.Su.f Solve real-world problems to find the area of a rectangle to identify total square units using visual models. (2.5)<br><br>MA.912.G.2.Su.g Identify the effect of changes in the lengths of sides of rectangles on perimeter using physical and visual models. (2.7) | |
| MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models. (3.1, 3.2)<br><br>MA.912.G.3.In.b Use tools to identify shapes as having one set of opposite sides parallel and equal in length (parallelograms). (3.3) | MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models. (3.1, 3.2)<br><br>MA.912.G.3.Su.b Determine whether shapes are rectangular or square by measuring the sides. (3.3)<br><br>MA.912.G.3.Su.c Identify shapes with one set of opposite sides parallel and equal in length (parallelograms) in the environment using physical and visual models. (3.3) | MA.912.G.3.Pa.a Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) in real-world situations. (3.1)<br><br>MA.912.G.3.Pa.b Match two or more objects with four-sided shapes (quadrilaterals), based on a given feature, such as length of side or size of the area. (3.2, 3.3) |
| MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual and physical models. (4.1, 4.7)<br><br>MA.912.G.4.In.b Identify the height (altitude) in equilateral and isosceles triangles using physical and visual models. (4.2, 4.5)<br><br>MA.912.G.4.In.c Measure sides | MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models. (4.1, 4.2, 4.5, 4.7)<br><br>MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent). (4.4, 4.6) | MA.912.G.4.Pa.a Identify objects, pictures, or signs with a triangle in real-world situations. (4.1, 4.5)<br><br>MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, 4.7) |

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| and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar). (4.4, 4.6) | | |
| MA.912.G.5.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse). (5.1)<br><br>MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models. (5.3) | MA.912.G.5.Su.a Identify right triangles in the environment using physical models. (5.1)<br><br>MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment. (5.3) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.6.In.a Identify and describe the circumference, arc, diameter, and radius of circles using physical and visual models. (6.2, 6.4)<br><br>MA.912.G.6.In.b Measure the diameter and radius of circles to solve real-world problems. (6.5)<br><br>MA.912.G.6.In.c Determine the relationship between a semi-circle and a circle. (6.6) | MA.912.G.6.Su.a Identify the circumference, arc, and diameter of circles in real-world situations. (6.2, 6.4)<br><br>MA.912.G.6.Su.b Compare the circumference and diameter of circles in real-world situations. (6.5)<br><br>MA.912.G.6.Su.c Identify examples of semi-circles in the environment. (6.6) | MA.912.G.6.Pa.a Identify objects, pictures, or signs with a circle in real-world situations. (6.2, 6.6)<br><br>MA.912.G.6.Pa.b Match two or more objects with a circle based on a given feature, such as size of the distance around the outside (circumference) or inside (area), in real-world situations. (6.4, 6.5) |
| MA.912.G.7.In.a Identify and describe three-dimensional solids, including sphere, cylinder, rectangular prism, and cone, in the environment using mathematical names. (7.1)<br><br>MA.912.G.7.In.b Identify a line that divides a sphere in half. (7.4)<br><br>MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height. (7.5)<br><br>MA.912.G.7.In.d Compare volumes of three-dimensional solids using physical and visual models. (7.6)<br><br>MA.912.G.7.In.e Identify the | MA.912.G.7.Su.a Identify properties of three-dimensional solids, such as sphere, cylinder, cube, and cone, in the environment, when given the common name. (7.1, 7.4)<br><br>MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations (7.5, 7.6)<br><br>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models. (7.7) | MA.912.G.7.Pa.a Identify objects or pictures with three-dimensional solids in real-world situations. (7.1, 7.6)<br><br>MA.912.G.7.Pa.b Match two or more objects with three-dimensional solids based on a given feature, such as the number of faces or overall size, in real-world situations. (7.4, 7.5, 7.6, 7.7) |

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| effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models. (7.7) | | |
| MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills. (8.3)<br><br>MA.912.G.8.In.b Use estimation and resources to determine if solutions to problems involving geometry concepts and skills are reasonable. (8.4) | MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills. (8.3)<br><br>MA.912.G.8.Su.b Use resources, such as calculators and conversion charts to verify accuracy of solutions to problems involving geometry concepts. (8.4) | MA.912.G.8.Pa.a Solve real-world problems involving objects with two- and three-dimensional shapes and match the result to the correct answer to determine accuracy. (8.3, 8.4) |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Geometry Honors

**Course Code** 1206320
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Core
**Course Title** Geometry Honors
**Course Level** 3
**Course Length** Full Year
**Credit Description** 1
**Abbreviated Title** Geometry Honors

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.1112.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |

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| MA.912.D.6.1 | Use truth tables to determine truth values of propositional statements. |
| MA.912.D.6.2 | Find the converse, inverse, and contrapositive of a statement |
| MA.912.D.6.3 | Determine whether two propositions are logically equivalent. |
| MA.912.D.6.4 | Use methods of direct and indirect proof and determine whether a short proof is logically valid. |
| MA.912.D.9.3 | Use vectors to model and solve application problems. |
| MA.912.D.11.5 | Explore and use other sequences found in nature such as the Fibonacci sequence and the golden ratio. |
| MA.912.G.1.1 | Find the lengths and midpoints of line segments in two-dimensional coordinate systems. |
| MA.912.G.1.2 | Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used. |
| MA.912.G.1.3 | Identify and use the relationships between special pairs of angles formed by parallel lines and transversals. |
| MA.912.G.2.1 | Identify and describe convex, concave, regular, and irregular polygons. |
| MA.912.G.2.2 | Determine the measures of interior and exterior angles of polygons, justifying the method used. |
| MA.912.G.2.3 | Use properties of congruent and similar polygons to solve mathematical or real-world problems. |
| MA.912.G.2.4 | Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons. |
| MA.912.G.2.5 | Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.). |
| MA.912.G.2.6 | Use coordinate geometry to prove properties of congruent, regular and similar polygons, and to perform transformations in the plane. |
| MA.912.G.2.7 | Determine how changes in dimensions affect the perimeter and area of common geometric figures. |
| MA.912.G.3.1 | Describe, classify, and compare relationships among the quadrilaterals the square, rectangle, rhombus, parallelogram, trapezoid, and kite. |
| MA.912.G.3.2 | Compare and contrast special quadrilaterals on the basis of their properties. |
| MA.912.G.3.3 | Use coordinate geometry to prove properties of congruent, regular and similar quadrilaterals. |
| MA.912.G.3.4 | Prove theorems involving quadrilaterals. |
| MA.912.G.4.1 | Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular. |
| MA.912.G.4.2 | Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors,orthocenter, centroid, incenter, and circumcenter. |
| MA.912.G.4.3 | Construct triangles congruent to given triangles. |
| MA.912.G.4.4 | Use properties of congruent and similar triangles to solve problems involving lengths and areas. |
| MA.912.G.4.5 | Apply theorems involving segments divided proportionally. |
| MA.912.G.4.6 | Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles. |

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| MA.912.G.4.7 | Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem. |
| MA.912.G.4.8 | Use coordinate geometry to prove properties of congruent, regular, and similar triangles. |
| MA.912.G.5.1 | Prove and apply the Pythagorean Theorem and its converse. |
| MA.912.G.5.2 | State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle. |
| MA.912.G.5.3 | Use special right triangles (30° - 60°- 90° and 45° - 45°- 90°) to solve problems. |
| MA.912.G.5.4 | Solve real-world problems involving right triangles. |
| MA.912.G.6.1 | Determine the center of a given circle. Given three points not on a line, construct the circle that passes through them. Construct tangents to circles. Circumscribe and inscribe circles about and within triangles and regular polygons. |
| MA.912.G.6.2 | Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles. |
| MA.912.G.6.3 | Prove theorems related to circles, including related angles, chords, tangents, and secants. |
| MA.912.G.6.4 | Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents). |
| MA.912.G.6.5 | Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors. |
| MA.912.G.6.6 | Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle. |
| MA.912.G.6.7 | Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle. |
| MA.912.G.7.1 | Describe and make regular, non-regular, and oblique polyhedra and sketch the net for a given polyhedron and vice versa. |
| MA.912.G.7.2 | Describe the relationships between the faces, edges, and vertices of polyhedra. |
| MA.912.G.7.3 | Identify, sketch, find areas and/or perimeters of cross sections of solid objects. |
| MA.912.G.7.4 | Identify chords, tangents, radii, and great circles of spheres |
| MA.912.G.7.5 | Explain and use formulas for lateral area, surface area, and volume of solids. |
| MA.912.G.7.6 | Identify and use properties of congruent and similar solids. |
| MA.912.G.7.7 | Determine how changes in dimensions affect the surface area and volume of common geometric solids. |
| MA.912.G.8.1 | Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates and theorems. |
| MA.912.G.8.2 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards. |
| MA.912.G.8.3 | Determine whether a solution is reasonable in the context of the original situation. |
| MA.912.G.8.4 | Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture. |
| MA.912.G.8.5 | Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs. |

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| MA.912.G.8.6 | Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing and drawing geometric figures. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.D.6.In.a Determine whether "if, then" statements for common events in real-world situations are true or false. (6.2)<br><br>MA.912.D.6.In.b Determine whether two statements have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Su.a Use pictures and objects to determine whether statements about common events in real-world situations are true or false. (6.2)<br><br>MA.912.D.6.Su.b Match two statements that have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Pa.a Recognize whether the solution to problems involving quantities to 10 in real-world situations is correct or incorrect. (6.2, 6.4, 6.5) |
| MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations. (1.1)<br><br>MA.912.G.1.In.b Locate angles formed when a line intersects two parallel lines and classify the angles as obtuse, acute, or right angles. (1.3) | MA.912.G.1.Su.a Determine the midpoint of a line. (1.1)<br><br>MA.912.G.1.Su.b Differentiate between intersecting and parallel lines. (1.3)<br><br>MA.912.G.1.Su.c Match types of angles, such as obtuse, acute, and right angles, using physical models and drawings. (1.3) | MA.912.G.1.Pa.a Recognize the ends and middle of a line. (1.1)<br><br>MA.912.G.1.Pa.b Recognize angles in two-dimensional shapes. (1.3) |
| MA.912.G.2.In.a Determine if polygons have all sides and angles equal (regular) or have sides or angles that are not equal (irregular) using physical and visual models. (2.1)<br><br>MA.912.G.2.In.b Use tools to measure angles, including 45° and 90°. (2.2)<br><br>MA.912.G.2.In.c Identify triangles and rectangles that are the same shape and size (congruent) and same shape but not same size (similar) using physical and visual models. (2.3, | MA.912.G.2.Su.a Identify polygons with all sides and angles equal (regular) in the environment. (2.1)<br><br>MA.912.G.2.Su.b Use a model of a right triangle to compare the size of angles, such as acute, obtuse, and right angles. (2.2)<br><br>MA.912.G.2.Su.c Match triangles and rectangles that are the same shape, but different size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.Su.d Match identical polygons in different positions, | MA.912.G.2.Pa.a Identify objects or pictures with polygons. (2.1, 2.2)<br><br>MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature in real-world situations. (2.3, 2.4, 2.6)<br><br>MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons in real-world situations. (2.5, 2.7) |

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| 2.6)<br><br>MA.912.G.2.In.d Use physical and visual models to show that a change in orientation, such as turns (rotations), slides (translations), and flips (reflections), does not change the size or shape of a polygon. (2.4)<br><br>MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems. (2.5)<br><br>MA.912.G.2.In.f Identify the effects of changes in the lengths of sides on the perimeter and area of rectangles using visual models to solve real-world problems. (2.7) | including turns (rotations), slides (translations), and flips (reflections) using physical models. (2.4)<br><br>MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models. (2.5)<br><br>MA.912.G.2.Su.f Solve real-world problems to find the area of a rectangle to identify total square units using visual models. (2.5)<br><br>MA.912.G.2.Su.g Identify the effect of changes in the lengths of sides of rectangles on perimeter using physical and visual models. (2.7) | |
| MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models. (3.1, 3.2)<br><br>MA.912.G.3.In.b Use tools to identify shapes as having one set of opposite sides parallel and equal in length (parallelograms). (3.3) | MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models. (3.1, 3.2)<br><br>MA.912.G.3.Su.b Determine whether shapes are rectangular or square by measuring the sides. (3.3)<br><br>MA.912.G.3.Su.c Identify shapes with one set of opposite sides parallel and equal in length (parallelograms) in the environment using physical and visual models. (3.3) | MA.912.G.3.Pa.a Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) in real-world situations. (3.1)<br><br>MA.912.G.3.Pa.b Match two or more objects with four-sided shapes (quadrilaterals), based on a given feature, such as length of side or size of the area. (3.2, 3.3) |
| MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual and physical models. (4.1, 4.7)<br><br>MA.912.G.4.In.b Identify the height (altitude) in equilateral and | MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models. (4.1, 4.2, 4.5, 4.7)<br><br>MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent). (4.4, | MA.912.G.4.Pa.a Identify objects, pictures, or signs with a triangle in real-world situations. (4.1, 4.5)<br><br>MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, |

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| isosceles triangles using physical and visual models. (4.2, 4.5)<br><br>MA.912.G.4.In.c Measure sides and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar). (4.4, 4.6) | 4.6) | 4.7) |
| MA.912.G.5.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse). (5.1)<br><br>MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models. (5.3) | MA.912.G.5.Su.a Identify right triangles in the environment using physical models. (5.1)<br><br>MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment. (5.3) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.6.In.a Identify and describe the circumference, arc, diameter, and radius of circles using physical and visual models. (6.2, 6.4)<br><br>MA.912.G.6.In.b Measure the diameter and radius of circles to solve real-world problems. (6.5)<br><br>MA.912.G.6.In.c Determine the relationship between a semi-circle and a circle. (6.6) | MA.912.G.6.Su.a Identify the circumference, arc, and diameter of circles in real-world situations. (6.2, 6.4)<br><br>MA.912.G.6.Su.b Compare the circumference and diameter of circles in real-world situations. (6.5)<br><br>MA.912.G.6.Su.c Identify examples of semi-circles in the environment. (6.6) | MA.912.G.6.Pa.a Identify objects, pictures, or signs with a circle in real-world situations. (6.2, 6.6)<br><br>MA.912.G.6.Pa.b Match two or more objects with a circle based on a given feature, such as size of the distance around the outside (circumference) or inside (area), in real-world situations. (6.4, 6.5) |
| MA.912.G.7.In.a Identify and describe three-dimensional solids, including sphere, cylinder, rectangular prism, and cone, in the environment using mathematical names. (7.1)<br><br>MA.912.G.7.In.b Identify a line that divides a sphere in half. (7.4)<br><br>MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height. (7.5)<br><br>MA.912.G.7.In.d Compare volumes of three-dimensional solids using physical and visual | MA.912.G.7.Su.a Identify properties of three-dimensional solids, such as sphere, cylinder, cube, and cone, in the environment, when given the common name. (7.1, 7.4)<br><br>MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations (7.5, 7.6)<br><br>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models. (7.7) | MA.912.G.7.Pa.a Identify objects or pictures with three-dimensional solids in real-world situations. (7.1, 7.6)<br><br>MA.912.G.7.Pa.b Match two or more objects with three-dimensional solids based on a given feature, such as the number of faces or overall size, in real-world situations. (7.4, 7.5, 7.6, 7.7) |

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| models. (7.6)<br><br>MA.912.G.7.In.e Identify the effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models. (7.7) | | |
| MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills. (8.3)<br><br>MA.912.G.8.In.b Use estimation and resources to determine if solutions to problems involving geometry concepts and skills are reasonable. (8.4) | MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills. (8.3)<br><br>MA.912.G.8.Su.b Use resources, such as calculators and conversion charts to verify accuracy of solutions to problems involving geometry concepts. (8.4) | MA.912.G.8.Pa.a Solve real-world problems involving objects with two- and three-dimensional shapes and match the result to the correct answer to determine accuracy. (8.3, 8.4) |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Analytic Geometry

**Course Code** 1206330
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Core
**Course Title** Analytic Geometry
**Course Level** 3
**Course Length** One Semester
**Credit Description** 0.5
**Abbreviated Title** Analytic Geometry

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; |

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| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.1112.3.2.2 | The student will draft writing by establishing a logical organizational pattern with supporting details that are substantial, specific, and relevant; and |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. |
| MA.912.A.8.7 | Solve applications of exponential growth and decay. |
| MA.912.A.9.1 | Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.). |
| MA.912.A.9.2 | Graph conic sections with and without using graphing technology. |
| MA.912.A.9.3 | Solve real-world problems involving conic sections |
| MA.912.D.6.4 | Use methods of direct and indirect proof and determine whether a short proof is logically valid. |
| MA.912.D.10.1 | Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion. |
| MA.912.D.10.2 | Convert from a parametric representation of a plane curve to a rectangular equation, and vice-versa. |
| MA.912.D.10.3 | Use parametric equations to model applications of motion in the plane. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.D.6.In.b Determine whether two statements have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Su.b Match two statements that have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Pa.a Recognize whether the solution to problems involving quantities to 10 in real-world situations is correct or incorrect. (6.2, 6.4, 6.5) |

# Integrated Mathematics 1

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|---|---|
| **Course Code** | 1207310 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Integrated Mathematics 1 |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Integrated Mathematics 1 |

| Scheme | Descriptor |
|---|---|
| LA.1.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1.1.6.2 | The student will listen to, read, and discuss both familiar and conceptually challenging text; |
| LA.1.1.6.5 | The student will relate new vocabulary to prior knowledge; |
| LA.1.3.1.3 | The student will prewrite by organizing ideas using simple webs, maps, or lists. |
| MA.912.A.2.3 | Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions. |
| MA.912.A.2.4 | Determine the domain and range of a relation. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.3.1 | Solve linear equations in one variable that include simplifying algebraic expressions. |
| MA.912.A.3.2 | Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.4 | Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution. |
| MA.912.A.3.7 | Rewrite equations of a line into slope-intercept form and standard form. |
| MA.912.A.3.8 | Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form . |
| MA.912.A.3.9 | Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |
| MA.912.A.3.11 | Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change. |
| MA.912.A.3.12 | Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph. |

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| MA.912.A.3.13 | Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.1 | Simplify monomials and monomial expressions using the laws of integral exponents. |
| MA.912.A.4.2 | Add, subtract, and multiply polynomials. |
| MA.912.A.4.3 | Factor polynomial expressions. |
| MA.912.A.6.1 | Simplify radical expressions |
| MA.912.A.6.2 | Add, subtract, multiply and divide radical expressions (square roots and higher). |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.G.1.1 | Find the lengths and midpoints of line segments in two-dimensional coordinate systems. |
| MA.912.G.1.2 | Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used. |
| MA.912.G.1.3 | Identify and use the relationships between special pairs of angles formed by parallel lines and transversals. |
| MA.912.G.1.4 | Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines. |
| MA.912.G.2.1 | Identify and describe convex, concave, regular, and irregular polygons. |
| MA.912.G.2.2 | Determine the measures of interior and exterior angles of polygons, justifying the method used. |
| MA.912.G.4.1 | Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular. |
| MA.912.G.4.2 | Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors,orthocenter, centroid, incenter, and circumcenter. |
| MA.912.G.5.1 | Prove and apply the Pythagorean Theorem and its converse. |
| MA.912.G.8.1 | Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates and theorems. |
| MA.912.G.8.2 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards. |
| MA.912.G.8.3 | Determine whether a solution is reasonable in the context of the original situation. |

| Access Points for Students with Significant Cognitive Disabilities | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph. (2.3)<br><br>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |

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| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4)<br><br>MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.c Use the commutative and associative properties of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations. (3.2)<br><br>MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4)<br><br>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations). (3.2)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |

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| MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms. (4.1)<br><br>MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication. (4.2)<br><br>MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations. (4.3)<br><br>MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models. (4.1)<br><br>MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations. (4.2)<br><br>MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.a Identify a missing item from two or more sets. (4.1)<br><br>MA.912.A.4.Pa.b Recognize that joining sets of objects results in a larger quantity and separating sets of objects results in a smaller quantity. (4.2)<br><br>MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.6.In.a Identify perfect squares and their factors, including 1, 4, 9, 16, 25, 49, 64, 100, and 144, using visual models. (6.1)<br><br>MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations. (6.2) | MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100, to solve problems. (6.1, 6.2) | MA.912.A.6.Pa.a Use one-to-one correspondence to identify equal sets of objects to solve problems. (6.1, 6.2) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |

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| MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations. (1.1)<br><br>MA.912.G.1.In.b Locate angles formed when a line intersects two parallel lines and classify the angles as obtuse, acute, or right angles. (1.3)<br><br>MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers. (1/4) | MA.912.G.1.Su.a Determine the midpoint of a line. (1.1)<br><br>MA.912.G.1.Su.b Differentiate between intersecting and parallel lines. (1.3)<br><br>MA.912.G.1.Su.c Match types of angles, such as obtuse, acute, and right angles, using physical models and drawings. (1.3)<br><br>MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid. (1.4) | MA.912.G.1.Pa.a Recognize the ends and middle of a line. (1.1)<br><br>MA.912.G.1.Pa.b Recognize angles in two-dimensional shapes. (1.3)<br><br>MA.912.G.1.Pa.c Solve real-world problems involving points, lines, angles, and areas (planes) using directional and positional language. (1.4) |
| MA.912.G.2.In.a Determine if polygons have all sides and angles equal (regular) or have sides or angles that are not equal (irregular) using physical and visual models. (2.1)<br><br>MA.912.G.2.In.b Use tools to measure angles, including 45° and 90°. (2.2) | MA.912.G.2.Su.a Identify polygons with all sides and angles equal (regular) in the environment. (2.1)<br><br>MA.912.G.2.Su.b Use a model of a right triangle to compare the size of angles, such as acute, obtuse, and right angles. (2.2) | MA.912.G.2.Pa.a Identify objects or pictures with polygons. (2.1, 2.2) |
| MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual and physical models. (4.1, 4.7)<br><br>MA.912.G.4.In.b Identify the height (altitude) in equilateral and isosceles triangles using physical and visual models. (4.2, 4.5) | MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models. (4.1, 4.2, 4.5, 4.7) | MA.912.G.4.Pa.a Identify objects, pictures, or signs with a triangle in real-world situations. (4.1, 4.5)<br><br>MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, 4.7) |

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| MA.912.G.5.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse). (5.1) | MA.912.G.5.Su.a Identify right triangles in the environment using physical models. (5.1) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills. (8.3) | MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills. (8.3) | MA.912.G.8.Pa.a Solve real-world problems involving objects with two- and three-dimensional shapes and match the result to the correct answer to determine accuracy. (8.3, 8.4) |

# Integrated Mathematics 2

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| **Course Code** | 1207320 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Integrated Mathematics 2 |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Integrated Mathematics 2 |

| Scheme | Descriptor |
|---|---|
| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.1.6.2 | The student will listen to, read, and discuss familiar and conceptually challenging text; |
| LA.910.1.6.5 | The student will relate new vocabulary to familiar words; |
| LA.910.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.1.8 | Use the zero product property of real numbers in a variety of contexts to identify solutions to equations. |
| MA.912.A.3.6 | Solve and graph the solutions of absolute value equations and inequalities with one variable. |
| MA.912.A.5.1 | Simplify algebraic ratios. |

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| MA.912.A.5.2 | Add, subtract, multiply, and divide rational expressions. |
| MA.912.A.5.3 | Simplify complex fractions. |
| MA.912.A.5.4 | Solve algebraic proportions. |
| MA.912.A.5.5 | Solve rational equations. |
| MA.912.A.7.1 | Graph quadratic equations with and without graphing technology. |
| MA.912.A.7.2 | Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula. |
| MA.912.A.7.6 | Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola. |
| MA.912.A.7.8 | Use quadratic equations to solve real-world problems. |
| MA.912.A.7.10 | Use graphing technology to find approximate solutions of quadratic equations. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.G.2.4 | Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons. |
| MA.912.G.2.5 | Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.). |
| MA.912.G.2.7 | Determine how changes in dimensions affect the perimeter and area of common geometric figures. |
| MA.912.G.3.1 | Describe, classify, and compare relationships among the quadrilaterals the square, rectangle, rhombus, parallelogram, trapezoid, and kite. |
| MA.912.G.3.2 | Compare and contrast special quadrilaterals on the basis of their properties. |
| MA.912.G.3.3 | Use coordinate geometry to prove properties of congruent, regular and similar quadrilaterals. |
| MA.912.G.3.4 | Prove theorems involving quadrilaterals. |
| MA.912.G.4.3 | Construct triangles congruent to given triangles. |
| MA.912.G.4.4 | Use properties of congruent and similar triangles to solve problems involving lengths and areas. |
| MA.912.G.4.5 | Apply theorems involving segments divided proportionally. |
| MA.912.G.4.6 | Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles. |
| MA.912.G.4.7 | Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem. |
| MA.912.G.5.2 | State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle. |
| MA.912.G.5.3 | Use special right triangles (30° - 60°- 90° and 45° - 45°- 90°) to solve problems. |
| MA.912.G.5.4 | Solve real-world problems involving right triangles. |

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| MA.912.G.6.2 | Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles. |
| MA.912.G.6.4 | Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents). |
| MA.912.G.6.5 | Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors. |
| MA.912.G.6.6 | Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle. |
| MA.912.G.6.7 | Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle. |
| MA.912.G.8.2 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards. |
| MA.912.G.8.3 | Determine whether a solution is reasonable in the context of the original situation. |
| MA.912.G.8.5 | Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs. |
| MA.912.G.8.6 | Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing and drawing geometric figures. |
| MA.912.S.2.3 | Identify sources of bias, including sampling and nonsampling errors. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |

| Access Points for Students with Significant Cognitive Disabilities | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.5.In.a Use numbers to represent ratios in real-world situations. (5.1)<br><br>MA.912.A.5.In.b Solve problems involving ratios in real-world situations. (5.4) | MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems. (5.1, 5.4) | MA.912.A.5.Pa.a Identify a simple ratio, such as 1 to 2, to solve real-world problems. (5.1, 5.4) |
| MA.912.A.7.In.a Use information from tables and visual models to plot numbers on a line graph representing real-world situations. (7.1)<br><br>MA.912.A.7.In.b Compare quantities from real-world situations represented on a graph and explain similarities and differences. (7.2)<br><br>MA.912.A.7.In.c Use equations involving addition, subtraction, multiplication, and division of whole numbers to solve real-world problems. (7.8) | MA.912.A.7.Su.a Identify information from tables and simple line graphs representing real-world situations. (7.1)<br><br>MA.912.A.7.Su.b Compare quantities from similar real-world situations represented on a graph. (7.2)<br><br>MA.912.A.7.Su.c Solve number sentences (equations) using visual and physical models representing real-world situations. (7.8) | MA.912.A.7.Pa.a Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which groups have more or less. (7.1, 7.2)<br><br>MA.912.A.7.Pa.b Solve problems by joining or separating quantities to 10 using objects, pictures, or symbols. (7.8) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |

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| MA.912.G.2.In.d Use physical and visual models to show that a change in orientation, such as turns (rotations), slides (translations), and flips (reflections), does not change the size or shape of a polygon. (2.4)<br><br>MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems. (2.5)<br><br>MA.912.G.2.In.f Identify the effects of changes in the lengths of sides on the perimeter and area of rectangles using visual models to solve real-world problems. (2.7) | MA.912.G.2.Su.d Match identical polygons in different positions, including turns (rotations), slides (translations), and flips (reflections) using physical models. (2.4)<br><br>MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models. (2.5)<br><br>MA.912.G.2.Su.f Solve real-world problems to find the area of a rectangle to identify total square units using visual models. (2.5)<br><br>MA.912.G.2.Su.g Identify the effect of changes in the lengths of sides of rectangles on perimeter using physical and visual models. (2.7) | MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature in real-world situations. (2.3, 2.4, 2.6)<br><br>MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons in real-world situations. (2.5, 2.7) |
| MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models. (3.1, 3.2)<br><br>MA.912.G.3.In.b Use tools to identify shapes as having one set of opposite sides parallel and equal in length (parallelograms). (3.3) | MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models. (3.1, 3.2)<br><br>MA.912.G.3.Su.b Determine whether shapes are rectangular or square by measuring the sides. (3.3)<br><br>MA.912.G.3.Su.c Identify shapes with one set of opposite sides parallel and equal in length (parallelograms) in the environment using physical and visual models. (3.3) | MA.912.G.3.Pa.a Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) in real-world situations. (3.1)<br><br>MA.912.G.3.Pa.b Match two or more objects with four-sided shapes (quadrilaterals), based on a given feature, such as length of side or size of the area. (3.2, 3.3) |
| MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual | MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models. (4.1, 4.2, 4.5, | MA.912.G.4.Pa.a Identify objects, pictures, or signs with a triangle in real-world situations. (4.1, 4.5)<br><br>MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the |

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| and physical models. (4.1, 4.7)<br><br>MA.912.G.4.In.b Identify the height (altitude) in equilateral and isosceles triangles using physical and visual models. (4.2, 4.5)<br><br>MA.912.G.4.In.c Measure sides and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar). (4.4, 4.6) | 4.7)<br><br>MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent). (4.4, 4.6) | length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, 4.7) |
| MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models. (5.3) | MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment. (5.3) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.6.In.a Identify and describe the circumference, arc, diameter, and radius of circles using physical and visual models. (6.2, 6.4)<br><br>MA.912.G.6.In.b Measure the diameter and radius of circles to solve real-world problems. (6.5)<br><br>MA.912.G.6.In.c Determine the relationship between a semi-circle and a circle. (6.6) | MA.912.G.6.Su.a Identify the circumference, arc, and diameter of circles in real-world situations. (6.2, 6.4)<br><br>MA.912.G.6.Su.b Compare the circumference and diameter of circles in real-world situations. (6.5)<br><br>MA.912.G.6.Su.c Identify examples of semi-circles in the environment. (6.6) | MA.912.G.6.Pa.a Identify objects, pictures, or signs with a circle in real-world situations. (6.2, 6.6)<br><br>MA.912.G.6.Pa.b Match two or more objects with a circle based on a given feature, such as size of the distance around the outside (circumference) or inside (area), in real-world situations. (6.4, 6.5) |
| MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills. (8.3) | MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills. (8.3) | MA.912.G.8.Pa.a Solve real-world problems involving objects with two- and three-dimensional shapes and match the result to the correct answer to determine accuracy. (8.3, 8.4) |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Integrated Mathematics 3

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| **Course Code** | 1207330 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Integrated Mathematics 3 |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Integrated Mathematics 3 |

| Scheme | Descriptor |
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| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.4.2.1 | The student will write in a variety of informational/expository forms, including a variety of technical documents (e.g., how-to-manuals, procedures, assembly directions); |
| MA.912.A.1.6 | Identify the real and imaginary parts of complex numbers and perform basic operations. |
| MA.912.A.2.5 | Graph absolute value equations and inequalities in two variables. |
| MA.912.A.2.6 | Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value). |
| MA.912.A.2.7 | Perform operations (addition, subtraction, division and multiplication) of functions algebraically, numerically, and graphically. |
| MA.912.A.2.8 | Determine the composition of functions. |
| MA.912.A.2.10 | Describe and graph transformations of functions |
| MA.912.A.2.11 | Solve problems involving functions and their inverses. |
| MA.912.A.3.14 | Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods. |
| MA.912.A.3.15 | Solve real-world problems involving systems of linear equations and inequalities in two and three variables. |
| MA.912.A.4.4 | Divide polynomials by monomials and polynomials with various techniques, including synthetic division. |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. |
| MA.912.A.4.10 | Use polynomial equations to solve real-world problems. |
| MA.912.A.6.4 | Convert between rational exponent and radical forms of expressions. |
| MA.912.A.6.5 | Solve equations that contain radical expressions. |
| MA.912.A.7.3 | Solve quadratic equations over the real numbers by completing the square. |
| MA.912.A.7.4 | Use the discriminant to determine the nature of the roots of a quadratic equation. |

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| MA.912.A.7.5 | Solve quadratic equations over the complex number system. |
| MA.912.A.8.1 | Define exponential and logarithmic functions and determine their relationship |
| MA.912.A.8.2 | Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values. |
| MA.912.A.8.3 | Graph exponential and logarithmic functions. |
| MA.912.A.8.5 | Solve logarithmic and exponential equations. |
| MA.912.A.8.6 | Use the change of base formula. |
| MA.912.A.8.7 | Solve applications of exponential growth and decay. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.A.10.3 | Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions). |
| MA.912.D.11.1 | Define arithmetic and geometric sequences and series. |
| MA.912.D.11.3 | Find specified terms of arithmetic and geometric sequences. |
| MA.912.G.7.1 | Describe and make regular, non-regular, and oblique polyhedra and sketch the net for a given polyhedron and vice versa. |
| MA.912.G.7.2 | Describe the relationships between the faces, edges, and vertices of polyhedra. |
| MA.912.G.7.4 | Identify chords, tangents, radii, and great circles of spheres |
| MA.912.G.7.5 | Explain and use formulas for lateral area, surface area, and volume of solids. |
| MA.912.G.7.6 | Identify and use properties of congruent and similar solids. |
| MA.912.G.7.7 | Determine how changes in dimensions affect the surface area and volume of common geometric solids. |
| MA.912.S.3.3 | Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data. |
| MA.912.S.3.4 | Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data. |
| MA.912.S.3.9 | Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |

| Access Points for Students with Significant Cognitive Disabilities | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations. (2.4, 2.12) | MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14) | MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14) |
| MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing. (4.3, 4.4) | MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts. (4.3, 4.4) | MA.912.A.4.Pa.c Separate groups of objects to 10 into sets with the same quantity. (4.3, 4.4) |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.G.7.In.a Identify and describe three-dimensional solids, including sphere, cylinder, rectangular prism, and cone, in the environment using mathematical names. (7.1) | MA.912.G.7.Su.a Identify properties of three-dimensional solids, such as sphere, cylinder, cube, and cone, in the environment, when given the common name. (7.1, 7.4) | MA.912.G.7.Pa.a Identify objects or pictures with three-dimensional solids in real-world situations. (7.1, 7.6)<br><br>MA.912.G.7.Pa.b Match two or |

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| MA.912.G.7.In.b Identify a line that divides a sphere in half. (7.4)<br><br>MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height. (7.5)<br><br>MA.912.G.7.In.d Compare volumes of three-dimensional solids using physical and visual models. (7.6)<br><br>MA.912.G.7.In.e Identify the effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models. (7.7) | MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations (7.5, 7.6)<br><br>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models. (7.7) | more objects with three-dimensional solids based on a given feature, such as the number of faces or overall size, in real-world situations. (7.4, 7.5, 7.6, 7.7) |
| MA.912.S.3.In.c Determine the mode by identifying the number that occurs most often and the mean by finding the average. (3.3) | MA.912.S.3.Su.c Identify the number that occurs most frequently (mode) in a set of data with up to nine numbers. (3.3) | MA.912.S.3.Pa.a Identify quantity in data sets of 10 by counting objects, pictures, or symbols and identify which category has more, less, or none. (3.1, 3.2, 3.3, 3.5) |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Liberal Arts Mathematics

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| **Course Code** | 1208300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Liberal Arts Mathematics |
| **Course Level** | 2 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |

**Abbreviated Title** Liberal Arts Mathematics

| Scheme | Descriptor |
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| LA.910.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.910.4.2.1 | The student will write in a variety of informational/expository forms, including a variety of technical documents (e.g., how-to-manuals, procedures, assembly directions); |
| MA.912.A.1.3 | Simplify real number expressions using the laws of exponents. |
| MA.912.A.1.4 | Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems. |
| MA.912.A.1.8 | Use the zero product property of real numbers in a variety of contexts to identify solutions to equations. |
| MA.912.A.2.1 | Create a graph to represent a real-world situation. |
| MA.912.A.2.2 | Interpret a graph representing a real-world situation. |
| MA.912.A.2.3 | Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions. |
| MA.912.A.3.3 | Solve literal equations for a specified variable. |
| MA.912.A.3.4 | Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution. |
| MA.912.A.3.5 | Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities. |
| MA.912.A.3.7 | Rewrite equations of a line into slope-intercept form and standard form. |
| MA.912.A.3.8 | Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form . |
| MA.912.A.3.9 | Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. |
| MA.912.A.3.10 | Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line. |
| MA.912.A.3.11 | Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change. |
| MA.912.A.3.13 | Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology. |
| MA.912.A.7.2 | Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula. |
| MA.912.G.1.1 | Find the lengths and midpoints of line segments in two-dimensional coordinate systems. |
| MA.912.G.1.4 | Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines. |
| MA.912.G.2.3 | Use properties of congruent and similar polygons to solve mathematical or real-world problems. |
| MA.912.G.2.5 | Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.). |
| MA.912.G.2.7 | Determine how changes in dimensions affect the perimeter and area of common |

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| | geometric figures. |
| MA.912.G.3.1 | Describe, classify, and compare relationships among the quadrilaterals the square, rectangle, rhombus, parallelogram, trapezoid, and kite. |
| MA.912.G.4.4 | Use properties of congruent and similar triangles to solve problems involving lengths and areas. |
| MA.912.G.5.3 | Use special right triangles (30° - 60°- 90° and 45° - 45°- 90°) to solve problems. |
| MA.912.G.5.4 | Solve real-world problems involving right triangles. |
| MA.912.G.7.5 | Explain and use formulas for lateral area, surface area, and volume of solids. |
| MA.912.G.7.7 | Determine how changes in dimensions affect the surface area and volume of common geometric solids. |
| MA.912.G.8.2 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards. |
| MA.912.G.8.3 | Determine whether a solution is reasonable in the context of the original situation. |
| MA.912.S.3.1 | Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. Formats to include:<br>• bar graphs<br>• line graphs<br>• stem and leaf plots<br>• circle graphs<br>• histograms<br>• box and whiskers plots<br>• scatter plots<br>• cumulative frequency (ogive) graphs |
| MA.912.S.3.2 | Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following:<br>• bar graphs<br>• line graphs<br>• stem and leaf plots<br>• circle graphs<br>• histograms<br>• box and whisker plots<br>• scatter plots<br>• cumulative frequency (ogive) graphs |

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| MA.912.S.3.3 | Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data. |
| MA.912.S.3.5 | Calculate and interpret the range and quartiles of a set of data. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.2.In.a Organize data from real-world situations into categories, identify the labels, and display in simple bar, line, and circle graphs. (2.1)<br><br>MA.912.A.2.In.b Interpret simple bar, line, and circle graphs representing data from real-world situations. (2.2)<br><br>MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph. (2.3) | MA.912.A.2.Su.a Organize data from real-world situations into categories, identify the labels, and display in pictographs and bar graphs. (2.1)<br><br>MA.912.A.2.Su.b Identify which categories have the largest, smallest, or the same amount in pictographs and bar graphs representing real-world situations. (2.2)<br><br>MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations. (2.3, 2.4, 2.12) | MA.912.A.2.Pa.a Count objects, pictures, or symbols used in a pictograph or chart and identify a total to 10. (2.1, 2.2)<br><br>MA.912.A.2.Pa.b Compare sets to 10 of objects, pictures, or symbols using one-to-one correspondence and identify which has more or less. (2.3, 2.4, 2.12) |
| MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations. (3.1, 3.4)<br><br>MA.912.A.3.In.d Solve equations involving common literal formulas related to real-world situations. (3.3)<br><br>MA.912.A.3.In.e Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.In.f Create function tables and simple graphs that | MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models. (3.1, 3.4)<br><br>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations. (3.4, 3.5)<br><br>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations. (3.4, 3.5, 3.15) | MA.912.A.3.Pa.a Identify quantities to 9 or more and add 1 more in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.b Identify quantities to 10 or more and take 1 away in real-world situations. (3.1, 3.2, 3.3)<br><br>MA.912.A.3.Pa.c Identify quantities to 10 as equal or unequal. (3.4, 3.5, 3.15)<br><br>MA.912.A.3.Pa.d Sort sets of objects to 10 into groups by quantity. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Pa.e Count |

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| show the mathematical relationship between number pairs. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.In.g Use function tables and simple graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | MA.912.A.3.Su.e Identify the mathematical relationship between number pairs in function tables, such as +2 or -3. (3.7, 3.8, 3.9, 3.12, 3.14)<br><br>MA.912.A.3.Su.f Use function tables and simple pictographs or bar graphs representing equations to make predictions for real-world situations. (3.10, 3.11, 3.13) | objects, pictures, or symbols used in a pictograph or chart and identify which category has the largest quantity. (3.10, 3.11, 3.13) |
| MA.912.A.7.In.b Compare quantities from real-world situations represented on a graph and explain similarities and differences. (7.2) | MA.912.A.7.Su.b Compare quantities from similar real-world situations represented on a graph. (7.2) | MA.912.A.7.Pa.a Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which groups have more or less. (7.1, 7.2) |
| MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations. (1.1)<br><br>MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers. (1/4) | MA.912.G.1.Su.a Determine the midpoint of a line. (1.1)<br><br>MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid. (1.4) | MA.912.G.1.Pa.a Recognize the ends and middle of a line. (1.1)<br><br>MA.912.G.1.Pa.c Solve real-world problems involving points, lines, angles, and areas (planes) using directional and positional language. (1.4) |
| MA.912.G.2.In.c Identify triangles and rectangles that are the same shape and size (congruent) and same shape but not same size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems. (2.5)<br><br>MA.912.G.2.In.f Identify the effects of changes in the lengths of sides on the perimeter and area of rectangles using visual models to solve real-world problems. (2.7) | MA.912.G.2.Su.c Match triangles and rectangles that are the same shape, but different size (similar) using physical and visual models. (2.3, 2.6)<br><br>MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models. (2.5)<br><br>MA.912.G.2.Su.f Solve real-world problems to find the area of a rectangle to identify total square units using visual models. (2.5)<br><br>MA.912.G.2.Su.g Identify the effect of changes in the lengths of sides of rectangles on perimeter using physical and visual models. (2.7) | MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature in real-world situations. (2.3, 2.4, 2.6)<br><br>MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons in real-world situations. (2.5, 2.7) |

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| MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models. (3.1, 3.2) | MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models. (3.1, 3.2) | MA.912.G.3.Pa.a Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) in real-world situations. (3.1) |
| MA.912.G.4.In.c Measure sides and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar). (4.4, 4.6) | MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent). (4.4, 4.6) | MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature, such as the length of the side or size of the angle, in real-world situations. (4.2, 4.3, 4.4, 4.6, 4.7) |
| MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models. (5.3) | MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment. (5.3) | MA.912.G.5.Pa.a Identify objects, pictures, or signs with a right triangle in real-world situations. (5.1, 5.3)<br><br>MA.912.G.5.Pa.b Match objects, pictures, or signs with a right triangle by a given feature, such as length of sides. (5.1, 5.3) |
| MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height. (7.5)<br><br>MA.912.G.7.In.e Identify the effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models. (7.7) | MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations (7.5, 7.6)<br><br>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models. (7.7) | MA.912.G.7.Pa.b Match two or more objects with three-dimensional solids based on a given feature, such as the number of faces or overall size, in real-world situations. (7.4, 7.5, 7.6, 7.7) |
| MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills. (8.3) | MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills. (8.3) | MA.912.G.8.Pa.a Solve real-world problems involving objects with two- and three-dimensional shapes and match the result to the correct answer to determine accuracy. (8.3, 8.4) |
| MA.912.S.3.In.a Describe information in bar graphs, circle graphs, and single-line graphs representing data from real-world | MA.912.S.3.Su.a Identify information in simple pictographs and bar graphs that represent data from real-world situations. (3.1) | MA.912.S.3.Pa.a Identify quantity in data sets of 10 by counting objects, pictures, or symbols and identify which |

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| situations. (3.1)<br><br>MA.912.S.3.In.b Collect data and display in single-line graphs, circle graphs, and bar graphs. (3.2)<br><br>MA.912.S.3.In.c Determine the mode by identifying the number that occurs most often and the mean by finding the average. (3.3)<br><br>MA.912.S.3.In.d Calculate the range and median for data from real-world situations. (3.5) | MA.912.S.3.Su.b Organize data in pictographs and bar graphs and identify the labels for categories. (3.2)<br><br>MA.912.S.3.Su.c Identify the number that occurs most frequently (mode) in a set of data with up to nine numbers. (3.3)<br><br>MA.912.S.3.Su.d Find the difference between the largest and smallest numbers in a set of data (range) and the median in a real-world situation. (3.5) | category has more, less, or none. (3.1, 3.2, 3.3, 3.5) |

# Advanced Topics in Mathematics

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|---|---|
| **Course Code** | 1298310 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Advanced Topics in Mathematics |
| **Course Level** | 2 |
| **Course Length** | Full year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Advanced Topics in Mathematics |

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; |
| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| MA.912.A.2.6 | Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value). |
| MA.912.A.2.8 | Determine the composition of functions. |

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| MA.912.A.2.9 | Recognize, interpret, and graph functions defined piece-wise, with and without technology. |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions. |
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots. |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. |
| MA.912.A.4.11 | Solve a polynomial inequality by examining the graph with and without the use of technology. |
| MA.912.A.5.1 | Simplify algebraic ratios. |
| MA.912.A.5.2 | Add, subtract, multiply, and divide rational expressions. |
| MA.912.A.5.3 | Simplify complex fractions. |
| MA.912.A.5.5 | Solve rational equations. |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. |
| MA.912.A.5.7 | Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio). |
| MA.912.A.7.5 | Solve quadratic equations over the complex number system. |
| MA.912.A.7.7 | Solve non-linear systems of equations with and without using technology. |
| MA.912.A.8.2 | Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values. |
| MA.912.A.8.3 | Graph exponential and logarithmic functions. |
| MA.912.A.8.5 | Solve logarithmic and exponential equations. |
| MA.912.A.9.1 | Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.). |
| MA.912.A.9.2 | Graph conic sections with and without using graphing technology. |
| MA.912.A.9.3 | Solve real-world problems involving conic sections |
| MA.912.D.8.1 | Use matrices to organize and store data. Perform matrix operations (addition, subtraction, scalar multiplication, multiplication) |
| MA.912.D.8.2 | Use matrix operations to solve problems. |
| MA.912.D.8.4 | Find the inverse of a matrix and use the inverse to solve problems with and without the use of technology. |
| MA.912.D.8.5 | Use determinants of 2 x 2 and 3 x 3 matrices as well as higher order matrices with and without the use of technology. |
| MA.912.D.11.1 | Define arithmetic and geometric sequences and series. |
| MA.912.D.11.2 | Use sigma notation to describe series. |
| MA.912.D.11.3 | Find specified terms of arithmetic and geometric sequences. |
| MA.912.D.11.4 | Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable. |

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| MA.912.F.1.1 | Explain the difference between simple and compound interest. |
| MA.912.F.1.2 | Solve problems involving compound interest. |
| MA.912.F.1.3 | Demonstrate the relationship between simple interest and linear growth |
| MA.912.F.1.4 | Demonstrate the relationship between compound interest and exponential growth |
| MA.912.F.2.1 | Calculate the future value of a given amount of money, with and without technology. |
| MA.912.P.1.1 | Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces. |
| MA.912.P.1.2 | Use formulas for permutations and combinations to count outcomes and determine probabilities of events. |
| MA.912.P.2.1 | Determine probabilities of complementary events, and calculate odds for and against the occurrence of events. |
| MA.912.P.2.2 | Determine probabilities of independent events. |
| MA.912.P.2.3 | Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events; finding conditional probabilities from a two-way frequency table. |
| MA.912.S.3.3 | Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data. |
| MA.912.S.3.4 | Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data. |
| MA.912.S.3.5 | Calculate and interpret the range and quartiles of a set of data. |
| MA.912.S.3.6 | Use empirical rules (e.g. 68-95-99.7 rule) to estimate spread of distributions and to make comparisons among sets of data. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |
| MA.912.T.2.2 | Solve real-world problems involving right triangles using technology when appropriate. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.5.In.a Use numbers to represent ratios in real-world situations. (5.1) | MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems. (5.1, 5.4) | MA.912.A.5.Pa.a Identify a simple ratio, such as 1 to 2, to solve real-world problems. (5.1, 5.4) |

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| MA.912.F.1.In.a Identify interest on a loan or credit card as money charged for borrowing money. (1.1)<br><br>MA.912.F.1.In.b Identify interest on a savings account as money earned by keeping money in the account over time. (1.1, 1.2)<br><br>MA.912.F.1.In.c Add the amount of a loan and amount of interest charged to determine the total amount of money to be repaid. (1.3) | MA.912.F.1.Su.a Identify interest as extra money charged when borrowing money. (1.1)<br><br>MA.912.F.1.Su.b Identify interest on a savings account as money earned by keeping money in the account. (1.1, 1.2)<br><br>MA.912.F.1.Su.c Identify interest rates used in real-world situations. (1.1, 1.2, 1.3) | MA.912.F.1.Pa.a Recognize that some items cost more than others. (1.1, 1.2, 1.3) |
| MA.912.F.2.In.a Identify situations that affect cost of living, such as inflation, wages, and location. (2.1) | MA.912.F.2.Su.a Identify examples of costs that have changed over time. (2.1) | MA.912.F.2.Pa.a Recognize that the cost of some items can change. (2.1) |
| MA.912.P.1.In.a Use visual representations, such as drawings or charts, to show possible combinations with three elements. (1.1) | MA.912.P.1.Su.a Use physical representations to show possible combinations with two elements. (1.1) | MA.912.P.1.Pa.a Recognize the probability of an event as certain or impossible. (1.1) |
| MA.912.P.2.In.a Identify if given outcomes for events in real-world situations are certain, likely, or impossible based on data in a graph or chart. (2.1, 2.2) | MA.912.P.2.Su.a Predict the likely outcome of a simple experiment or event by selecting from three choices of outcomes. (2.1, 2.2) | MA.912.P.2.Pa.a Predict the next activity in real-world situations. (2.1, 2.2) |
| MA.912.S.3.In.c Determine the mode by identifying the number that occurs most often and the mean by finding the average. (3.3)<br><br>MA.912.S.3.In.d Calculate the range and median for data from real-world situations. (3.5) | MA.912.S.3.Su.c Identify the number that occurs most frequently (mode) in a set of data with up to nine numbers. (3.3)<br><br>MA.912.S.3.Su.d Find the difference between the largest and smallest numbers in a set of data (range) and the median in a real-world situation. (3.5) | MA.912.S.3.Pa.a Identify quantity in data sets of 10 by counting objects, pictures, or symbols and identify which category has more, less, or none. (3.1, 3.2, 3.3, 3.5) |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

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| (hypotenuse) by measuring the sides. (2.1)<br><br>MA.912.T.2.In.b Identify and construct right triangles to solve real-world problems. (2.2) | MA.912.T.2.Su.b Use right triangles to solve real-world problems. (2.2) | |

# Probability and Statistics with Applications

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| **Course Code** | 1210300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Probability and Statistics |
| **Course Level** | 3 |
| **Course Length** | Full Year |
| **Credit Description** | 1 |
| **Abbreviated Title** | Probability and Statistics |

| Scheme | Descriptor |
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| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.6.9 | The student will determine the correct meaning of words with multiple meanings in context; |
| LA.1112.6.2.3 | The student will write an informational report that integrates information and makes distinctions between the relative value and significance of specific data, facts, and ideas; and |
| MA.912.P.1.1 | Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces. |
| MA.912.P.1.2 | Use formulas for permutations and combinations to count outcomes and determine probabilities of events. |
| MA.912.P.2.1 | Determine probabilities of complementary events, and calculate odds for and against the occurrence of events. |
| MA.912.P.2.2 | Determine probabilities of independent events. |
| MA.912.P.2.3 | Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events; finding conditional probabilities from a two-way frequency table. |
| MA.912.P.3.1 | Determine probabilities of events from distributions, including:<br>• discrete uniform (all outcomes in a finite set equally likely)<br>• binomial<br>• normal<br>• exponential |
| MA.912.P.3.2 | Determine the mean and variance of distributions, including: |

- discrete uniform (all outcomes in a finite set equally likely)
- binomial
- normal
- exponential

MA.912.P.3.3 Apply the properties of the normal distribution.

MA.912.P.3.4 Apply the Central Limit Theorem to determine the probability that a sample mean will be in a certain interval.

MA.912.S.1.1 Formulate an appropriate research question to be answered by collecting data or performing an experiment.

MA.912.S.1.2 Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment.

MA.912.S.2.1 Compare the difference between surveys, experiments, and observational studies, and what types of questions can and cannot be answered by a particular design.

MA.912.S.2.2 Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses.

MA.912.S.2.3 Identify sources of bias, including sampling and nonsampling errors.

MA.912.S.3.1 Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. Formats to include:

- bar graphs
- line graphs
- stem and leaf plots
- circle graphs
- histograms
- box and whiskers plots
- scatter plots
- cumulative frequency (ogive) graphs

MA.912.S.3.2 Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following:

- bar graphs
- line graphs
- stem and leaf plots
- circle graphs
- histograms
- box and whisker plots

- scatter plots
- cumulative frequency (ogive) graphs

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| MA.912.S.3.3 | Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data. |
| MA.912.S.3.4 | Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data. |
| MA.912.S.3.5 | Calculate and interpret the range and quartiles of a set of data. |
| MA.912.S.3.6 | Use empirical rules (e.g. 68-95-99.7 rule) to estimate spread of distributions and to make comparisons among sets of data. |
| MA.912.S.3.7 | Calculate the correlation coefficient of a set of paired data, and interpret the coefficient as a measure of the strength and direction of the relationship between the variables. |
| MA.912.S.3.8 | Determine whether a data distribution is symmetric or skewed based on an appropriate graphical presentation of the data. |
| MA.912.S.3.9 | Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data. |
| MA.912.S.4.1 | Explain and interpret the concepts of confidence level and “margin of error”. |
| MA.912.S.4.2 | Use a simulation to approximate sampling distributions for the mean, using repeated sampling simulations from a given population. |
| MA.912.S.4.3 | Apply the Central Limit Theorem to solve problems. |
| MA.912.S.4.4 | Approximate confidence intervals for means using simulations of the distribution of the sample mean. |
| MA.912.S.4.5 | Find the equation of the least squares regression line for a set of data |
| MA.912.S.5.1 | Analyze the relationship between confidence level, margin of error and sample size. |
| MA.912.S.5.2 | Apply the general principles of hypothesis testing. |
| MA.912.S.5.3 | Explain and identify the following: null hypothesis, alternative hypotheses, Type I error, and Type II error. |
| MA.912.S.5.4 | Explain the meaning of p-value and its role in hypothesis testing. |
| MA.912.S.5.5 | Perform hypothesis tests of means and proportions for large samples, using simulations to determine whether a sample mean (proportion) has a low likelihood of occurring. |
| MA.912.S.5.6 | Interpret the results of hypothesis tests of means and proportions, and make decisions based on p-values of test. |
| MA.912.S.5.8 | Use a regression line equation to make predictions. |
| MA.912.S.5.9 | Interpret the coefficient of determination, $r^2$, for a least-squares regression. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
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| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.P.1.In.a Use visual representations, such as drawings or charts, to show possible combinations with three | MA.912.P.1.Su.a Use physical representations to show possible combinations with two elements. (1.1) | MA.912.P.1.Pa.a Recognize the probability of an event as certain or impossible. (1.1) |

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| elements. (1.1) | | |
| MA.912.P.2.In.a Identify if given outcomes for events in real-world situations are certain, likely, or impossible based on data in a graph or chart. (2.1, 2.2) | MA.912.P.2.Su.a Predict the likely outcome of a simple experiment or event by selecting from three choices of outcomes. (2.1, 2.2) | MA.912.P.2.Pa.a Predict the next activity in real-world situations. (2.1, 2.2) |
| MA.912.S.2.In.a Identify when data from part of a group (sample) should not be used to make predictions regarding the whole group. (2.3) | MA.912.S.2.Su.a Identify problems with inaccurate counting when collecting data and use strategies to correct mistakes. (2.3) | MA.912.S.2.Pa.a Identify a missing part of objects, pictures, or symbols in real-world situations. (2.3) |
| MA.912.S.3.In.a Describe information in bar graphs, circle graphs, and single-line graphs representing data from real-world situations. (3.1)<br><br>MA.912.S.3.In.b Collect data and display in single-line graphs, circle graphs, and bar graphs. (3.2)<br><br>MA.912.S.3.In.c Determine the mode by identifying the number that occurs most often and the mean by finding the average. (3.3)<br><br>MA.912.S.3.In.d Calculate the range and median for data from real-world situations. (3.5) | MA.912.S.3.Su.a Identify information in simple pictographs and bar graphs that represent data from real-world situations. (3.1)<br><br>MA.912.S.3.Su.b Organize data in pictographs and bar graphs and identify the labels for categories. (3.2)<br><br>MA.912.S.3.Su.c Identify the number that occurs most frequently (mode) in a set of data with up to nine numbers. (3.3)<br><br>MA.912.S.3.Su.d Find the difference between the largest and smallest numbers in a set of data (range) and the median in a real-world situation. (3.5) | MA.912.S.3.Pa.a Identify quantity in data sets of 10 by counting objects, pictures, or symbols and identify which category has more, less, or none. (3.1, 3.2, 3.3, 3.5) |

# Trigonometry

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| **Course Code** | 1211300 |
| **Course Category** | 6-12 |
| **Subject Area** | Mathematics |
| **Course Type** | Core |
| **Course Title** | Trigonometry |
| **Course Level** | 3 |
| **Course Length** | One Semester |
| **Credit Description** | 0.5 |
| **Abbreviated Title** | Trigonometry |

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; |
| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. |
| LA.1112.3.2.2 | The student will draft writing by establishing a logical organizational pattern with supporting details that are substantial, specific, and relevant; and |
| MA.912.D.9.1 | Demonstrate an understanding of the geometric interpretation of vectors and vector operations including addition, scalar multiplication, dot product and cross product in the plane and in three-dimensional space. |
| MA.912.D.9.2 | Demonstrate an understanding of the algebraic interpretation of vectors and vector operations including addition, scalar multiplication, dot product and cross product in the plane and in three-dimensional space. |
| MA.912.D.9.3 | Use vectors to model and solve application problems. |
| MA.912.T.1.1 | Convert between degree and radian measures. |
| MA.912.T.1.2 | Define and determine sine and cosine using the unit circle. |
| MA.912.T.1.3 | State and use exact values of trigonometric functions for special angles, i.e. multiples of $\frac{\pi}{6}$ and $\frac{\pi}{4}$ (degree and radian measures) |
| MA.912.T.1.4 | Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology. |
| MA.912.T.1.5 | Make connections between right triangle ratios, trigonometric functions, and circular functions. |
| MA.912.T.1.6 | Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology. |
| MA.912.T.1.7 | Define and graph inverse trigonometric relations and functions. |
| MA.912.T.1.8 | Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate. |
| MA.912.T.2.1 | Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles. |
| MA.912.T.2.2 | Solve real-world problems involving right triangles using technology when appropriate. |
| MA.912.T.2.3 | Apply the laws of sines and cosines to solve real-world problems using technology. |
| MA.912.T.2.4 | Use the area of triangles given two sides and an angle or three sides to solve real-world problems. |
| MA.912.T.3.1 | Verify the basic Pythagorean identities, e.g., $sin^2x + cos^2x = 1$, and show they are equivalent to the Pythagorean Theorem. |

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|---|---|
| MA.912.T.3.2 | Use basic trigonometric identities to verify other identities and simplify expressions. |
| MA.912.T.3.3 | Use the sum and difference, half-angle and double-angle formulas for sine, cosine, and tangent, when formulas are provided. |
| MA.912.T.3.4 | Solve trigonometric equations and real-world problems involving applications of trigonometric equations using technology when appropriate. |
| MA.912.T.4.1 | Define polar coordinates and relate polar coordinates to Cartesian coordinates with and without the use of technology. |
| MA.912.T.4.2 | Represent equations given in rectangular coordinates in terms of polar coordinates. |
| MA.912.T.4.3 | Graph equations in the polar coordinate plane with and without the use of graphing technology. |
| MA.912.T.4.4 | Define the trigonometric form of complex numbers, convert complex numbers to trigonometric form, and multiply complex numbers in trigonometric form. |
| MA.912.T.4.5 | Apply DeMoivre's Theorem to perform operations with complex numbers. |

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides. (2.1)<br><br>MA.912.T.2.In.b Identify and construct right triangles to solve real-world problems. (2.2) | MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest. (2.1)<br><br>MA.912.T.2.Su.b Use right triangles to solve real-world problems. (2.2) | MA.912.T.2.Pa.a Recognize a right triangle in objects, pictures, or signs in real world situations. (2.1, 2.2) |

# Discrete Mathematics

**Course Code** 1220910
**Course Category** 6-12
**Subject Area** Mathematics
**Course Type** Core
**Course Title** Discrete Mathematics
**Course Level** 3
**Course Length** Full Year
**Credit Description** 1
**Abbreviated Title** Discrete Mathematics

| Scheme | Descriptor |
|---|---|
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; |
| LA.1112.1.6.9 | The student will determine the correct meaning of words with multiple meanings in |

| | |
|---|---|
| | context; |
| LA.1112.2.2.3 | The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, comparing, contrasting, outlining); |
| MA.912.A.7.9 | Solve optimization problems. |
| MA.912.A.10.1 | Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table. |
| MA.912.A.10.2 | Decide whether a solution is reasonable in the context of the original situation. |
| MA.912.D.1.1 | Use recursive and iterative thinking to solve problems, including identification of patterns, population growth and decline, and compound interest. |
| MA.912.D.1.2 | Use finite differences to solve problems and to find explicit formulas for recurrence relations. |
| MA.912.D.1.3 | Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications. |
| MA.912.D.2.1 | Use Euler and Hamilton cycles and paths in graphs to solve routing problems. |
| MA.912.D.2.2 | Use critical path analysis to solve scheduling problems. |
| MA.912.D.2.3 | Use graph coloring techniques to solve problems. |
| MA.912.D.2.4 | Use spanning trees, rooted trees, binary trees, and decision trees to solve problems. |
| MA.912.D.4.1 | Solve maximal profit/minimal cost problems. |
| MA.912.D.6.1 | Use truth tables to determine truth values of propositional statements. |
| MA.912.D.6.2 | Find the converse, inverse, and contrapositive of a statement |
| MA.912.D.6.3 | Determine whether two propositions are logically equivalent. |
| MA.912.D.6.4 | Use methods of direct and indirect proof and determine whether a short proof is logically valid. |
| MA.912.D.6.5 | Identify and give examples of :<br>• undefined terms;<br>• axioms;<br>• theorems;<br>• inductive and deductive proofs; and,<br>• inductive and deductive reasoning. |
| MA.912.D.6.6 | Construct logical arguments using laws of detachment (modus ponens), syllogism, tautology, and contradiction; judge the validity of arguments, and give counterexamples to disprove statements. |
| MA.912.D.6.7 | Use applications of the universal and existential quantifiers to propositional statements. |
| MA.912.D.7.1 | Perform set operations such as union and intersection, and complement. |
| MA.912.D.7.2 | Use Venn diagrams to explore relationships and patterns, and to make arguments about relationships between sets. |
| MA.912.D.8.1 | Use matrices to organize and store data. Perform matrix operations (addition, subtraction, scalar multiplication, multiplication) |

MA.912.D.8.2 Use matrix operations to solve problems.

MA.912.D.8.4 Find the inverse of a matrix and use the inverse to solve problems with and without the use of technology.

MA.912.D.8.5 Use determinants of 2 x 2 and 3 x 3 matrices as well as higher order matrices with and without the use of technology.

MA.912.D.8.6 Use matrices to solve Markov chain problems that link present events to future events using probabilities.

MA.912.D.11.1 Define arithmetic and geometric sequences and series.

MA.912.D.11.2 Use sigma notation to describe series.

MA.912.D.11.3 Find specified terms of arithmetic and geometric sequences.

MA.912.D.11.4 Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.

MA.912.D.11.5 Explore and use other sequences found in nature such as the Fibonacci sequence and the golden ratio.

MA.912.P.1.1 Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.

MA.912.P.1.2 Use formulas for permutations and combinations to count outcomes and determine probabilities of events.

MA.912.P.2.2 Determine probabilities of independent events.

| **Access Points for Students with Significant Cognitive Disabilities** | | |
|---|---|---|
| ***Independent:*** | ***Supported:*** | ***Participatory:*** |
| MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems. (10.1, 10.2)<br><br>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable. (10.2, 10.3) | MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems. (10.1, 10.2)<br><br>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems. (10.2, 10.3) | MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 10, matching the result to the correct answer to determine accuracy. (10.1, 10.2, 10.3) |
| MA.912.D.6.In.a Determine whether “if, then” statements for common events in real-world situations are true or false. (6.2)<br><br>MA.912.D.6.In.b Determine whether two statements have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Su.a Use pictures and objects to determine whether statements about common events in real-world situations are true or false. (6.2)<br><br>MA.912.D.6.Su.b Match two statements that have the same mathematical meaning. (6.4, 6.5) | MA.912.D.6.Pa.a Recognize whether the solution to problems involving quantities to 10 in real-world situations is correct or incorrect. (6.2, 6.4, 6.5) |

| | | |
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| MA.912.D.7.In.a Identify and sort elements in two sets, combine the sets to identify elements in either set to form a union, and identify the elements that are in both sets (intersection) using physical and visual models. (7.1)<br><br>MA.912.D.7.In.b Use Venn diagrams to represent the elements in both sets (intersection) of two sets. (7.2) | MA.912.D.7.Su.a Sort elements into two sets and combine elements in either set to form a union using physical and visual models. (7.1)<br><br>MA.912.D.7.Su.b Use physical models to identify elements from both sets that belong together (intersection). (7.2) | MA.912.D.7.Pa.a Sort the common element from two sets of objects. (7.1, 7.2) |
| MA.912.P.1.In.a Use visual representations, such as drawings or charts, to show possible combinations with three elements. (1.1) | MA.912.P.1.Su.a Use physical representations to show possible combinations with two elements. (1.1) | MA.912.P.1.Pa.a Recognize the probability of an event as certain or impossible. (1.1) |
| MA.912.P.2.In.a Identify if given outcomes for events in real-world situations are certain, likely, or impossible based on data in a graph or chart. (2.1, 2.2) | MA.912.P.2.Su.a Predict the likely outcome of a simple experiment or event by selecting from three choices of outcomes. (2.1, 2.2) | MA.912.P.2.Pa.a Predict the next activity in real-world situations. (2.1, 2.2) |

## Advanced Placement Courses

Course descriptions for AP Calculus (AB and BC) and AP Statistics are provided by the College Board and are available on line at this website:

http://apcentral.collegeboard.com/apc/public/courses/descriptions/index.html

# Major Priorities for Instructional Materials

## Content, Presentation, Learning

The priorities as described in this specification document were developed from research findings about what makes instructional materials effective. These priorities have undergone review by individuals who have served on state and district committees, by curriculum specialists, by instructional designers, by evaluation specialists, and by administrators of the statewide adoption system.

Instructional materials must be effective in three major priority areas: content, presentation, and learning. The following sections describe essential features for each of these priority areas. These features generally apply to all formats of instructional materials, whether print or other media/multiple media formats.

## Content

Some features of content coverage have received progressively more attention over the past decade. These features include:

| |
|---|
| **A. ALIGNMENT WITH CURRICULUM REQUIREMENTS** |
| **B. LEVEL OF TREATMENT OF CONTENT** |
| **C. EXPERTISE FOR CONTENT DEVELOPMENT** |
| **D. ACCURACY OF CONTENT** |
| **E. RELEVANCE OF CONTENT** |
| **F. AUTHENTICITY OF CONTENT** |
| **G. MULTICULTURAL REPRESENTATION** |
| **H. HUMANITY AND COMPASSION** |

## A. ALIGNMENT WITH CURRICULUM REQUIREMENTS

**Content must align with the Sunshine State Standards for the subject area of MATHEMATICS. These curriculum requirements can be accessed at the following web site: http://www.floridastandards.org**

**Correlations.** Publishers are expected to provide correlation reports in the provided form to show exactly where and to what extent (mentioned or in-depth) the instructional materials cover each required student performance standard within the Sunshine State Standards and/or Course Descriptions for Mathematics. Publishers will want to correlate instructional materials of any subject-area to the reading and math state-assessed benchmarks when appropriate and possible.

**Scope.** The content should address Florida's required curriculum standards for the subject, grade level, and learning outcomes, including thinking and learning skills.

**Completeness.** The content of the major tool should be complete enough to stand on its own. Either the student edition or the teacher edition may be considered to be the major tool. To be useful for classroom instruction, instructional materials must be adaptable to the instructional goals and course outlines for individual school districts, as well as the state standards. Content should have no major omissions in the required content coverage, and be free of unrelated facts and information that would detract from achievement of Florida's specified Course Descriptions and Sunshine State Standards.

## B. LEVEL OF TREATMENT OF CONTENT

**The level of complexity or difficulty of content must be appropriate for the standards, student abilities and grade level, and time periods allowed for teaching.**

**See Florida Statutes 1006.31(4)(e); 1006.34(2)(a); 1006.34(2)(b)**

**Objectives.** Content should be simple, complex, technical, or nontechnical enough for the intended objectives.

**Students.** Content should be developmentally appropriate for the age and maturity level of the intended students. It should contain sufficient details for students to understand the significance of the information presented and to engage in reflection and discussion.

**Time.** The level of complexity or difficulty of content also should allow for its coverage during the time periods available for teaching the subject.

## C. EXPERTISE FOR CONTENT DEVELOPMENT

**Expertise in the content area and in education of the intended students must be reflected in the authors, reviewers, and sources that contributed to the development of the materials. See Florida Statutes 1006.38(15)**

**Authorship.** The authors, consultants, and reviewers must have actually contributed to the development of the instructional materials and should have credentials that reflect expertise in mathematics, mathematics education, course category, grade level, pedagogy, education, teaching, and classroom instruction. Qualifications may include expertise in educational psychology or instructional design.

**Sources.** Primary and secondary sources should reflect expert information for the mathematics education, such as relevant data from research journals, and other recognized scientific sources. The type of sources considered appropriate will vary with the particular subject area.

**In the subject area of MATHEMATICS, expertise is expected to include authors commonly accepted in the field of mathematics education research, curriculum development, assessment, and staff development.**

## D. ACCURACY OF CONTENT

**Content must be accurate in historical context and contemporary facts and concepts. See Florida Statutes 1006.38; 1006.31(4)(e)**

**Objectivity**. Content that is included in the materials should accurately represent the domain of knowledge and events. It should be objective. It should be free of mistakes, errors, inconsistencies, contradictions within itself, and biases of interpretation. It should be free of the biased selection of information. Materials should distinguish between facts and possible interpretations or opinions expressed about factual information. Visuals or other elements of instruction should contribute to the accuracy of text or narrative.

**Representativeness**. The selection of content should not misrepresent the domain of knowledge and events. It should include the generally accepted and prevalent theories, major concepts, laws, standards, and models used within the discipline of the subject area.

**Correctness.** Presentation of content should be free of typographical and visual errors. It should include correct grammar, spelling, linguistics, terminology, definitions, descriptions, visuals, graphs, sounds, videos, and all other components of the instructional materials.

**For the subject area of MATHEMATICS, publishers must submit materials that connect mathematics with a variety of subject areas. Regardless of the particular topic, the information presented must be accurate in historical context and contemporary facts and concepts.**

## E. CURRENTNESS OF CONTENT

**Content must be up-to-date for the academic discipline and the context in which the content is presented. See Florida Statutes 1006.37(1)(e); 1006.38**

**Dates or editions.** Copyright dates for photographs and other materials and editions should suggest sufficient currentness of content. Copyright dates and editions serve as indicators about currentness. However, neither the copyright date nor the edition guarantees currentness. Subsequent editions should reflect more up-to-date information than earlier editions.

Informed examination of the text, narrative, and visuals contained in the materials provides the most direct information about currentness of the materials.

**Context.** Text or narrative, visuals, photographs, and other features should reflect the time periods appropriate for the objectives and the intended learners.

- Sometimes context should be current. For example, a photograph used to show stages of human growth and development will be more relevant when the clothing, hairstyles, and activities reflect present-day styles.
- Sometimes context should be historical. For example, illustrations and photographs of historical events should reflect the historical time period.
- Sometimes context should be both current and historical. For example, historic images alongside modern ones would convey changes in styles over time.
- At all times the context should be relevant to the learner, to the Curriculum Frameworks , and to the concept presented.

## F. AUTHENTICITY OF CONTENT

**Content should include problem-centered connections to life in a context that is meaningful to students. See Florida Statutes 1006.31(e); 1006.31(4)(b); 1003.42**

**Life connections.** Instructional materials should include connections to the student's life situations in order to make the content meaningful. Students might be expected to deal with time constraints, consider risks and trade-offs in decision-making, and work with teams. Connections may be made to situations of daily home life, careers, vocation, community events and services, and leisure or recreation.

**Interdisciplinary treatment.** Instructional materials also should include interdisciplinary connections in order to make content meaningful. Examples of situations that connect a variety of subject areas include building projects, playing sports, retrieving information or objects, balancing budgets, creating products, and researching information. In addition to connections between mathematical concepts and representations, instructional materials should connect the course or course category to other disciplines and student experiences.

Examples of approaches to interdisciplinary connections include:

- explanations and activities for using skills and knowledge from other academic disciplines
- assignments that require students to relate learning from other disciplines rather than to isolate knowledge or skills
- the focus on common themes across several subject areas (infusion, parallel, transdisciplinary, or multidisciplinary instruction)

**In the subject area of MATHEMATICS, publishers must integrate materials to all appropriate content areas and should refer to *Sunshine State Standards* for the content areas.**

## G. MULTICULTURAL REPRESENTATION

**Portrayal of gender, ethnicity, age, work situations, and various social groups must include multicultural fairness and advocacy. See Florida Statutes 1003.42; 1006.31(4)(a); 1006.341**

**Multicultural fairness.** Through balanced representation of cultures and groups in multiple settings, occupations, careers, and lifestyles, the materials should support equal opportunity without regard for age, color, gender, disability, national origin, race, or religion. It is not the number of pages devoted to diversity, equity, or work roles, but the substance of what is stated and portrayed that matters most. For this reason, it can be misleading to count the number of pages or illustrations devoted to a social issue or group. It is more important to focus on the integration of social diversity throughout a set of instructional materials.

In addition to balanced representations, the portrayal of individuals and situations must exclude biases and stereotypes. These portrayals must promote an understanding and appreciation of the importance and contributions of diverse cultures and heritage.

**Multicultural advocacy.** The understanding and appreciation of multiple cultures extends beyond fair representation. It involves embracing a multicultural context, not just through pictures, but through information about ways to honor differences and deal with conflicts, promote a positive self-image for members of all groups, and provide for the development of healthy attitudes and values. Students should be provided opportunities to interpret issues from different perspectives, understanding each others' opinions and developing empathy.

*In the subject area of MATHEMATICS, contributions of various cultures to the development of mathematics throughout the history should be included in the introduction of concepts, whenever appropriate. Multicultural representation also includes consideration of different learner types such as visual, auditory, kinesthetic, etc.*

Effective treatment of multicultural issues requires consideration of the age and ability levels of students and whether or not it is appropriate to include multicultural issues in the study of a particular topic. Overall, however, materials should reflect both multicultural fairness and advocacy.

## H. HUMANITY AND COMPASSION

**Portrayal of the appropriate care and treatment of people and animals must include compassion, sympathy, and consideration of their needs and values and exclude hard-core pornography and inhumane treatment. See Florida Statutes 1003.42; 1006.31(4)©; 1006.34(2)(b)**

**Inclusion of compassion.** When providing examples in narrative or visuals, materials sometimes depict the care and treatment of people and animals. Generally, this means showing in some way a measure of compassion, sympathy, or consideration of their needs and feelings.

**Exclusion of inhumanity.** In the context of personal and family values, Florida expressly prohibits material containing *hard-core pornography*. In addition, although the definition of *inhumane treatment* can sometimes appear to be controversial, as in science research, there is general agreement that instructional materials should not advocate any form of inhumane treatment.

As with the evaluation of multicultural representation, it is important to consider the context of the subject and the age and abilities of the students.

## REFERENCES FOR CONTENT FEATURES

*For a complete list of references and citations, please refer to* **Destination: Florida Classrooms—Evaluator's Handbook,** *or request a list of references from the Department of Education, Bureau of School Improvement.*

# Presentation

Features of presentation affect the practical usefulness of materials and the ease of finding and understanding content. These features include:

| |
|---|
| **A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES** |
| **B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS** |
| **C. ORGANIZATION OF INSTRUCTIONAL MATERIALS** |
| **D. READABILITY OF INSTRUCTIONAL MATERIALS** |
| **E. PACING OF CONTENT** |
| **F. EASE OF USE OF MATERIALS** |

The following sections describe the presentation features expected for each of these areas.

## A. COMPREHENSIVENESS OF STUDENT AND TEACHER RESOURCES

**Resources must be complete enough to address the targeted learning outcomes without requiring the teacher to prepare additional teaching materials for the course. See Florida Statutes 1006.34(2)(a); 1006.34(2)(b)**

Materials should contain support for students in completing instructional activities and assessments and for teachers in implementing all of the instructional elements. A variety of components can accomplish this purpose. Typically, materials will include test items, study guides, outlines and strategies for teaching, media supplements, learning activities, and projects.

The major components generally expected for student and teacher resources are listed below.

**Student resources.** Student materials typically include the major text or program with text or narration, visuals, assignments, and assessments. Formats may include print, audio, visual, computer, or other media like CDs, DVDs, PPTs, calculators, or software adaptable for interactive whiteboards.

Effective instructional materials generally integrate the use of reference aids (e.g., index, glossary, maps, bibliography, graphic organizers, and pictures) with the topic being studied. Items that guide students through materials might include clearly labeled materials, directions and explanations, and assignments with menus of choices.

Review activities should require students to recall or apply previously taught knowledge and skills. Frequent short reviews over time or space improve learning more than a concentrated review. Assignments and stages of small practice improve speed and accuracy.

Other components might include enrichment and remediation activities, additional resources, and tests and assessment tools either in the student materials or in the teacher's guide or edition.

**In the subject area of MATHEMATICS, publishers must provide enrichment and remediation activities to the students and teachers in electronic format.**

**Teacher resources.** Teacher materials typically include a teacher's edition with the annotated student text and copies of ancillary written materials with answer keys, worksheets, tests, diagrams, etc., so that the teacher has to use only one guide. Inservice training, workshops, and consulting services should be made available by publishers to support teachers in implementing instructional materials. Professional development is essential to the success of any program, especially when a program contains non-traditional elements. Publishers should clearly indicate the recommended amount and types of professional development that they will provide, and they should work with districts and schools to ensure that teachers receive the support that they need. The materials for the teacher should support continued teacher learning.

Support, guidelines, resources, or features such as the ones described below should be available to help teachers effectively implement materials in classroom and school settings.

**(1) Components and materials are easy to use:** Examples include clearance, license, or agreement for copying and use of materials; clear description and accurate directions for use of required equipment, facilities, resources, and environment; clearly labeled grade, lesson, content, and other information to identify components; correct specifications for making instructional media and electronic programs work effectively.

**(2) Materials support lesson planning, teaching, and learning:** Examples include overview of components and objectives; background for lectures and discussions; technical terminology, and reinforcement and review strategies; scope and sequence chart for activities and planning; sample lesson plans; suggestions for individualized study, small-group and large-group presentations and discussions, school-to-work activities, field or laboratory experiences, safety procedures, and other extension activities; suggestions for integrating themes across the subject area or course curriculum and forming connections to other disciplines; and suggestions for parental and community involvement.

**(3) Suggestions are provided for adapting instruction for varying needs:** Examples include alternative approaches to teaching, pacing, and options for varied delivery of instruction such as media, tools, equipment, and emerging technology; strategies for engaging all students, such as open-ended questions to stimulate thinking, journals, hands-on investigations, explorations, and multisensory approaches; suggestions for addressing common student difficulties or adapting to multiple learning styles; and alternative reteaching, enrichment, and remediation strategies.

**(4) Guidelines and resources are provided on how to implement and evaluate instruction:** Examples include answers to work assignments, practice activities, and tests; sample projects or research results; suggestions for using learning tasks for

classroom assessment; guidelines for alternative assessments, such as sample checklists, rubrics, peer or performance assessments, and portfolios.

**(5) Resources are provided to use in classroom activities:** Examples include technology resources ; lists of resources and references, reading strategies, materials to use for displays or photocopies ,classroom management strategies and documentation on how to manage the entire instructional program; in-service workshops or consultation support from the publisher.

## B. ALIGNMENT OF INSTRUCTIONAL COMPONENTS

**All components of an instructional package must align with each other, as well as with the curriculum. See Florida Statutes 1006.29(4)**

All components of an instructional package—teacher's edition and materials, student's edition and materials, workbook, ancillary materials, and others—must be integrated and complementary and must correspond with each other. For example, support materials in the teacher's edition should align with student activities or assignments. They must match in content and progression of instructional activities.

## C. ORGANIZATION OF INSTRUCTIONAL MATERIALS

**The structure and format of materials must have enough order and clarity to allow students and teachers to access content and explicitly identify ideas and sequences. See Florida Statutes 1006.34(2)(a); 1006.34(2)(b)**

**Access to content.** Some features help in searching and locating information, such as a table of contents; menu or map of content; directions on how to locate information or complete assignments; an index for quick reference; goals and/or objectives, outlines, lists, or checklists for major sections; bibliographies and lists of resources; glossaries for quick access to major terms; introductions, key concepts and themes, visual cues, illustrations, labeled examples, and labeled reviews or summaries.

**Visible structure and format.** At-a-glance features should signal the organization of content. The following features are desirable:

- chapter or unit titles and/or frames; headings and subheadings;
- typographic cues such as bold, italics or changes in size of type;
- divisions of content such as borders, boxes, circles, highlighting, visual signposts, icons, or color cues;
- diagrams, labels, and visuals placed near the related content; and numbering of pages and other components.

Objectives or a content outline may serve a similar purpose by introducing main ideas, providing guideposts to use in searching for key information, or serving as a checklist for self-assessment.

Certain types of brief narrative sections also contribute to clear organization. For example, the statement of a clear purpose with content organized around main ideas, principles, concepts, and logical relationships supports the unity and flow of information. Introductions also play a major role when they include anchoring ideas, a list of key points, or conceptual schemes such as metaphors. Summaries also can assist students in understanding the logical order of topics presented.

**Logical organization.** The pattern of organization of the content should be consistent and logical for the type of subject or topic. Patterns of organization may include comparison and contrast, time sequence, cause-effect or problem-solution-effect, concrete to abstract, introduction-review-extension (spiral structure), simple-to-complex, whole-part or part-whole, generalization-examples-review-practice, and conflict-inside view-structure.

## D. READABILITY OF INSTRUCTIONAL MATERIALS

**Narrative and visuals should engage students in reading or listening as well as in understanding of the content at a level appropriate to the students' abilities. See Florida Statutes 1006.31(e); 1006.34(2)(a); 1006.34(2)(b)**

**Language style.** Language style and visual features can influence the readability of materials. Yet, a popular tool for assessing readability has been the use of a *readability formula* of one type or another. These formulas tend to focus only on a few *countable* characteristics of language style such as the length of words, sentences, and/or paragraphs.

Other features are more important in establishing the readability of instructional materials, such as

- organized, coherent text
- language and concepts familiar to the student
- language that clarifies, simplifies, and explains information
- transition words such as "yet," "also," "next," "for example," "moreover," or "however"
- other phrases that create logical connections
- words with concrete and specific images
- active rather than passive voice
- varied sentence structures and avoid both choppy sentences and unnecessary words
- specific questions or directions to guide student attention to visuals or key information

**Visual features.** Visual features that improve readability include

- print that is dark and clear, with good contrast
- paper with clean-cut edges without glare, or computer screens without glare
- margins wide enough on a page or screen to allow easy viewing of the text
- chunking text (Sentence ends on same page as it begins.)
- visuals that are relevant, clear, vivid, and simple enough for students to understand
- quantity of visuals suitable for the intended students—both lower ability students and higher ability students tend to require more visuals
- unjustified text (ragged on the right) rather than justified (lined up on the right)

- visuals that contain information in a form different from the text
- graphs, charts, maps, and other visual representations integrated at their point of use
- colors, size of print, spacing, quantity, and type of visuals suitable for the abilities and needs of the intended students

## E. PACING OF CONTENT

**The amount of content presented at one time or the pace at which it is presented must be of a size or rate that allows students to perceive and understand it. See Florida Statutes 1006.31(e); 1006.34(2)(a); 1006.34(2)(b)**

It is important that materials contain "bite-size" chunks or blocks of information. The chunks should not be so large, nor the pacing so fast, as to overwhelm students. Neither should the chunks be so small, nor the pacing so slow, as to bore them.

## F. EASE OF USE OF MATERIALS

**Both print and other media formats of instructional materials must be easy to use and replace and be durable enough for multiple uses over time. See Florida Statutes 1006.29(4); 1006.38(3)(a); 1006.34(2)(a); 1006.34(2)(b); 1006.38(5); 1006.38(6)(7)(8)(9)**

**Warranty.** The actual physical and technical qualities of materials should match the description contained in the publisher's warranty.

**Use.** Materials must be designed for practical use in the classroom and school environments. They must be easy to identify and store. Teachers and students must be able to access and use the materials. Some of the factors influencing their ease of use include number of components, size of components, packaging, quality of materials, equipment requirements, and cost to purchase or replace components.

The best choice about weight, size, and number of volumes depends on several factors, such as the organization of the content, how well separate volumes may fit time periods for instruction, and the ages of students. Technical production requirements, such as page limits or different types of bindings, may lead to multiple volumes.

Examples of classroom use include repeated copying of consumable materials and repeated use of other materials by students over time. Students should be able to easily use the materials and take home, in a convenient form, most of the material they need to learn for the course.

Technology-rich resources should work properly without the purchase of additional software and run without error. Electronic media for student use should be encoded to prevent accidental or intentional erasure or modification. As with textbooks, electronic media should allow students to easily access and interact with them without extensive supervision or special assistance.

The physical and technical qualities of materials should match with the resources of the schools. Materials such as videos, software, CD-ROMs, Internet sites, and transparencies may serve instructional purposes well, but have little value unless they can be implemented with the

school's equipment. Publishers should include training, inservice, and consultation to help in effective use of the materials.

**Durability.** Students and teachers should be able to have materials that will be durable under conditions of expected use. For example, boxes, books, or other materials should not fall apart after normal classroom use. The packaging and form of materials should be flexible and durable enough for multiple uses over time. Durability includes considerations such as

- high-quality paper, ink, binding, and cover
- back, joints, body block, and individual pages
- worry-free technology that runs properly, with easy to hear, see, and control audio and visuals, and
- the publisher's guarantee for replacement conditions and agreements for reproduction needed to effectively use the materials

**Cost.** *Florida's Commissioner of Education will consider the impact of cost in making final decisions.* Cost, while not a direct factor in ease of use, influences the ease with which materials can be obtained or replaced. The impact of cost can be complex to estimate. It requires considering the number of materials available at no additional cost with the purchase of the major program or text, the cost over the adoption period of several years, and the number of free materials to support implementation. Attractive features such as higher quality paper and visuals and greater use of color may escalate cost, without enhancing learning effectiveness.

## REFERENCES FOR PRESENTATION FEATURES

*For a complete list of references and citations, please refer to* **Destination: Florida Classrooms—Evaluator's Handbook,** *or request a list of references from the Department of Education, Bureau of School Improvement.*

# Learning

The following features have been found to promote learning and apply to most types of learning outcomes.

| |
|---|
| **A. MOTIVATIONAL STRATEGIES** |
| **B. TEACHING A FEW "BIG IDEAS"** |
| **C. EXPLICIT INSTRUCTION** |
| **D. GUIDANCE AND SUPPORT** |
| **E. ACTIVE PARTICIPATION** |
| **F. TARGETED INSTRUCTIONAL STRATEGIES** |
| **G. TARGETED ASSESSMENT STRATEGIES** |

The following sections describe the learning features expected for each of these priority areas.

## A. MOTIVATIONAL STRATEGIES

**Instructional materials must include features to maintain learner motivation. See Florida Statutes 1006.31(e); 1006.34(2)(a)(b); 1006.38(4)**

**Expectations.** Materials should positively influence the expectations of students. Examples include:

- positive expectations for success
- novel tasks or other approaches to stimulate intellectual curiosity
- meaningful tasks related to student interests, cultural backgrounds, and developmental levels
- activities with relevance to the student's life
- thought-provoking challenges such as paradoxes, dilemmas, problems, controversies, and questioning of traditional ways of thinking
- challenges that are neither too difficult to achieve nor so easy that students become bored
- hands-on tasks in a concrete context, and images, sounds, analogies, metaphors, or humorous anecdotes
- variety, including the opportunity for students to ask their own questions, set their own goals, and make other choices during learning

**Feedback.** Materials should include informative and positive feedback on progress. Examples include:

- frequent checks on progress, including testing
- explanatory feedback with information about correctness or incorrectness of responses, how to avoid or correct common mistakes, and/or different approaches to use
- varied forms of assessments (self-assessment, peer assessment, and some learning tasks without formal assessments)

**Appearance.** Materials should have an appearance generally considered attractive to the intended students.

## B. TEACHING A FEW "BIG IDEAS"

**Instructional materials should thoroughly teach a few important ideas, concepts, or themes. See Florida Statutes 1006.31(e); 1006.34(2)(a)(b)**

**Focus.** Thoroughly teaching a few big ideas provides focus for the learner's attention. It provides an organizing framework for integrating new information.

**Completeness.** The thorough teaching of a few big ideas may focus on developing a deeper and more complete understanding of the major themes of a discipline, the content of the subject area, relationships to other disciplines, and the thinking and learning skills required for achieving the specified learning outcomes.

## C. EXPLICIT INSTRUCTION

**Instructional materials must contain clear statements of information and outcomes. See Florida Statutes 1006.31(e); 1006.34(2)(a)(b)**

**Clarity of directions and explanations.** To support success in learning, instructional materials should include clear presentation and explanations of

- purposes, goals, and expected outcomes
- concepts, rules, information, and terms
- models, examples, questions, and feedback

For example, if students are expected to complete a cooperative group activity, the overall goal of the activity, roles of the group members, the procedures to complete the activity, and the method for the group to report their findings should be explicitly stated. Additionally, there should be guidance for the teacher to form groups, to promote individual accountability and positive interdependence among group members, and to monitor and facilitate group process.

**Exclusion of ambiguity.** Instructional materials should avoid terms and phrases with ambiguous meanings, confusing directions or descriptions, and inadequate explanations.

## D. GUIDANCE AND SUPPORT

**Instructional materials must include guidance and support to help students safely and successfully become more independent learners and thinkers. See Florida Statutes 1006.31(e); 1006.34(2)(a)**

**Level.** The type of guidance and support that helps students to become more independent learners and thinkers is sometimes referred to as *scaffolding.* Scaffolding is a solid structure of support that can be removed after a job has been completed. As students gain proficiency, support can diminish, and students can encounter more complex, life-centered problems. Information and activities should provide guidance and support at the level that is needed—no more and no less. Too much can squelch student interest, and too little can lead to failure.

For example, when solving a mathematics problem, there could be guidance for the teacher to scaffold students' problem solving abilities. If the students have failed to solve a problem, the teacher can have the students reflect on their process by asking them to share the problem solving strategies they have used so far, can ask follow-up questions to guide the students' thinking, or can provide hints to help the students come up with ideas to solve the problem.

**Adaptability.** Guidance and support must be adaptable to developmental differences and various learning styles. For example, young children tend to understand concepts in concrete terms and over-generalize new concepts. Some students need more time, some tend to be more impulsive than reflective, some have trouble distinguishing relevant from irrelevant information, and some have better written than spoken language skills.

Approaches for developmental differences and learning styles of students, include

- a variety of *activities* such as
  (1) structured and unstructured activities
  (2) independent and group work
  (3) teacher-directed and discovery learning
  (4) visual and narrative instruction
  (5) hands-on activities
  (6) open-ended activities
  (7) practice without extrinsic rewards or grades
  (8) simple, complex, concrete, and abstract examples
  (9) variable pacing or visual breaks

- a variety of *modalities* for the various learning styles of students, such as
  (1) linguistic-verbal
  (2) logical-mathematical
  (3) musical
  (4) spatial
  (5) bodily-kinesthetic

(6) interpersonal
(7) intrapersonal
(8) naturalist

## E. ACTIVE PARTICIPATION OF STUDENTS

**Instructional materials must engage the physical and mental activity of students during the learning process. See Florida Statutes 1006.31(e); 1006.34(2)(a)**

**Assignments.** Instructional materials should include assignments that are logical extensions of content, goals, and objectives.

**Student responses.** Assignments should include questions and application activities during learning that give students opportunities to respond. Active participation of students can be accomplished in a variety of ways. For example, information and activities might require students to accomplish the types of activities listed below.

- respond orally or in writing
- create visual representations (charts, graphs, diagrams, and illustrations)
- generate products
- generate their own questions or examples
- think of new situations for applying or extending what they learn
- complete discovery activities
- add details to big ideas or concepts from prior knowledge
- form their own analogies and metaphors
- practice lesson-related tasks, procedures, behaviors, or skills
- choose from a variety of activities

## F. TARGETED INSTRUCTIONAL STRATEGIES

**Instructional materials should include the strategies known to be successful for teaching the learning outcomes targeted in the curriculum requirements. See Florida Statutes 1006.31(e); 1006.34(2)(a)(b); 1003.42**

**Alignment.** Research has documented the strategies that effectively teach different types of learning outcomes. The learning strategies included in instructional materials should match the findings of research for the targeted learning outcomes. Different types of learning outcomes require different strategies. For example, a strategy for memorizing verbal information might be helpful, but it would not align with the strategies required for learning a concept or for learning how to solve a problem.

**Completeness.** Not only should strategies be aligned, but they also should be complete enough to effectively teach the targeted outcomes. For example, while the explanation of a problem-solving method or model would be appropriate, other strategies also would be necessary in order for students to learn how to resolve different types of problems.

## G. TARGETED ASSESSMENT STRATEGIES

**Instructional materials should include assessment strategies that are known to be successful in determining how well students have achieved the targeted learning outcomes. See Florida Statutes 1006.31(e); 1006.34(2)(a)(b); 1006.38(4)**

**Alignment.** The assessment strategies should match the learner performance requirements for the types of learning outcomes that have been targeted for the subject matter, course, or course category. Different strategies are appropriate for assessing different types of learning outcomes. For example, a strategy for testing the acquisition of verbal information would not match the requirements for testing whether or not a student has learned a concept or learned how to solve a problem.

The term "assessment," as used in this section, refers to testing or other strategies that assess student progress as a result of learning activities. The results of such assessment provide information about where to strengthen instruction. But it is very important to ask the right questions. If the type of question matches the type of learning outcome, then students and teachers have relevant information about learning progress.

Formative assessment strategies should be identified, and suggestions for incorporating information gathered from assessment to guide "next steps" in instruction is very important.

**Completeness.** In addition to including assessment strategies that align with the performance requirements of the targeted learning outcomes, the strategies should be complete enough to effectively assess the learner's performance with regard to the targeted outcome. For example, a test item that requires the student to state a rule does not assess whether or not the student knows how to *use* the rule.

**For the subject area of MATHEMATICS, it is particularly important to frequently assess the progress of students. Student understanding of mathematical concepts proceed to increasing levels of complexity over time. Thus, students who miss the prerequisite knowledge have great difficulty in making progress in later grades. Early and frequent formative assessment of progress helps teachers in determining what activities or teaching methods may be appropriate for individual students or whole class instruction.**

## REFERENCES FOR LEARNING FEATURES

*For a complete list of references and citations, please refer to* **Destination: Florida Classrooms—Evaluator's Handbook,** *or request a list of references from the Department of Education, Bureau of School Improvement.*

# Criteria for Evaluation

The instructional materials adoption process must be fair to all publishers who take the time and expense to submit their materials. Applying evaluation criteria consistently to each submission assures that the materials will be judged fairly.

Regardless of format or technology, effective materials have certain characteristics in common, and the basic issues, important for the evaluation of instructional materials, apply to all subject areas and all formats. These issues are addressed in Florida's list of priorities and the criteria as detailed in the previous pages of this document. The first link provided below is to the evaluation instrument used by adoption committee members. Evaluators will use the criteria-based instrument to engage in systematic reflection of the processes they follow and decisions they make about the quality of materials submitted by publishers.

The extensive research base and review processes used to identify these criteria establish their validity as an integral part of Florida's instructional materials adoption system. Applying these criteria consistently to each submission helps assure that the materials submitted by publishers will be judged fairly.

The State Instructional Materials Committees will complete a Committee Questionnaire for each submission at the adoption meetings. The Committee Questionnaire is a compilation of the criteria in the committee member evaluation instrument and serves as the official record of the State Instructional Materials Committee. The second link is to the Committee Questionnaire.

http://www.fldoe.org/bii/instruct_mat/

http://www.fldoe.org/bii/instruct_mat/pdf/ccq.pdf

# Link to Curriculum Requirements/Sunshine State Standards

The Florida course descriptions for mathematics can be found at the following link:

www.floridastandards.org

The Sunshine State Standards for mathematics, along with remarks and examples to help clarify benchmarks, can be found at the following links:

www.floridastandards.org

http://www.fldoestem.org/FLDOE_STEM/Florida_Mathematics_Standards.aspx

# Requirements for Braille Textbook Production

**Instructions for Preparing Computer Diskettes and CDs Required for Automated Braille Textbook Production**

## STATUTORY AUTHORIZATION

Chapter 1003.55(5), Florida Statutes, states that, "….any publisher of a textbook adopted pursuant to the state instructional materials adoption process shall furnish the Department of Education with a computer file in an electronic format specified by the Department at least 2 years in advance that is readily translatable to Braille and can be used for large print or speech access. Any textbook reproduced pursuant to the provisions of this subsection shall be purchased at a price equal to the price paid for the textbook as adopted. The Department of Education shall not reproduce textbooks obtained pursuant to this subsection in any manner that would generate revenues for the department from the use of such computer files or that would preclude the rightful payment of fees to the publisher for use of all or some portion of the textbook."

## OBJECTIVE

Electronic text (etext) is needed to accelerate the production of textbooks in Braille and other accessible formats through the use of translation software. Some embedded publisher formatting commands help speed the conversion of English text to Braille or other accessible formats. Therefore, the objective of these instructions is to prompt publishers to provide textbook data in a format that will be useful to Braille and other accessible format producers while at the same time allowing each publisher the flexibility of using existing composition or typesetting systems. Publishers may produce etext files in one of three formats, as shown in the specifications below.

By April 1, 1998, publishers of adopted student textbooks for literary subjects must be able to provide the computer diskettes UPON REQUEST. Publishers shall provide nonliterary subjects when technology becomes available for the conversion of nonliterary materials to the appropriate format.

The requested computer diskettes shall be provided to the Florida Instructional Materials Center for the Visually Impaired (FIMC), 5002 North Lois Avenue, Tampa, Florida 33614; (813) 872-5281; in Florida WATS (800) 282-9193 or (813) 872-5284 (FAX). The center will contact each publisher of an adopted textbook and provide delivery instructions.

## SPECIFICATIONS

FORMAT (Three Options):

a. A full implementation of Standard Generalized Markup Language (SGML).
b. XML-Extensible Markup Language
c. ASCII – (Last Resort!)

2. OPERATING SYSTEM: Windows

3. DISKETTE SIZE: 3.5, CD, Zip100

4. DISKETTE CAPACITY: Double-sided/high density

5. DISKETTE LABELING:

a. Sequential Number/ISBN
b. Book Title
c. File Name
d. Name of Publisher
e. Name of Typesetting Company/Contact Name
f. Format Option and Version
g. Copyright Date
h. Wording such as: "All rights reserved. As described in Chapter 233.0561(5), Florida Statutes, no use may be made of these diskettes other than the creating of a Braille, Large Print, or Recorded version of the materials contained on this diskette for students with visual impairments in the State of Florida."

6. REQUIRED CONTENTS:

a. Title Page
b. List of Consultants and Reviewers (if appropriate)
c. Table of Contents
d. All Textbook Chapters
e. All Appendices
f. All Glossaries
g. Indices

7. FILE STRUCTURE: Each chapter of a textbook will be formatted as a separate file.

8. FILE LIST: A separate file listing the structure of the primary files must be provided. This file should be labeled DISKLIST TEXT. In addition, all special instructions (e.g., merging of materials kept in a separate file) should be noted in this file.

9. LOCATION OF SPECIAL DATA: Marginal notes, footnotes, captions, and other special items must be placed consistently within each text file.

10. CORRECTIONS AND CHANGES A conscientious effort should be made to update files to exactly duplicate the adopted printed version of the textbook (including corrections and changes). If this cannot be accomplished in a timely and cost effective manner, the publisher will coordinate with the FIMC Supervisor and provide to the Supervisor one set of marked tearsheets of all corrections and changes not included in the files.

# Federal Requirements for the National Instructional Materials Accessibility Standard (NIMAS)

**National Instructional Materials Accessibility Standard (NIMAS)** guides the production and electronic distribution of digital versions of textbooks and other instructional materials so they can be more easily converted to accessible formats, including braille and text-to-speech. A National Instructional Materials Access Center (NIMAC) has been established to receive and catalog publishers' electronic files of print instructional materials in the NIMAS format.

These files will be used for the production of alternate formats as permitted under the law for students with print disabilities. Under these guidelines, “textbook” means the principal tool of instruction used in the classroom. It is a printed book or books that contain most, if not all, of the academic content a student needs to learn to meet the State or Local Education Agency’s curriculum requirements for that subject area. “Related core materials” are printed materials, other than textbooks, designed for use by students in the classroom in conjunction with a textbook and which, together with the textbook, are necessary to meet the curriculum requirements for the intended course. The materials should be directly related to the textbook and wherever possible they should be published by the publisher of the textbook. Related core materials do not include materials that are not written and published primarily for use by students in the classroom (e.g., trade books not bundled with the textbook, newspapers and reference works) nor ancillary or supplemental materials that are not necessary to meet the curriculum requirements for the intended course. For purposes of these definitions, the term “curriculum requirements for the intended course” refers to relevant curriculum standards and requirements as established by a state educational agency or local educational agency.

The details of the metadata elements required as part of the NIMAS File set will be found at http://nimac.us/metadata.html. Please note that some elements are required, while others are optional. Some fields also allow for multiple entries (e.g., subject terms).

Complete information concerning NIMAS and NIMAC can be found at http://nimas.cast.org and http://www.nimac.us. (IDEA-2004).

The following Correlation chart is provided as one example of information publishers will be required to provide in the mathematics adoption.

Please be advised that this is only one of the correlation forms that publishers will be required to use. Correlation forms to Access Points for Students with Significant Cognitive Disabilities will also be required.

All Correlation Forms will be made available to publishers as part of the "Forms Required for Bidding."

# CORRELATION
## FLORIDA DEPARTMENT OF EDUCATION
## MATHEMATICS SPECIFICATIONS 2008-2009

| | |
|---|---|
| **SUBJECT:** | **Mathematics** |
| **GRADE LEVEL:** | **6-12** |
| **COURSE TITLE:** | **Analytic Geometry** |
| **COURSE CODE:** | **1206330** |
| **SUBMISSION TITLE:** | |
| **PUBLISHER:** | |

| | | | | Committee Member Evaluation (Committee Member Use Only) | | | | |
|---|---|---|---|---|---|---|---|---|
| **BENCHMARK CODE** | **BENCHMARK** | **PAGES OR LOCATIONS WHERE BENCHMARK IS DIRECTLY ADRESSED IN MAJOR TOOL** | **I/M*** | **Thoroughly** | **Highly** | **Satisfactorily** | **Minimally** | **Not At All** |
| LA.1112.1.6.1 | The student will use new vocabulary that is introduced and taught directly; | | | | | | | |
| LA.1112.1.7.1 | The student will use background knowledge of subject and related content areas, prereading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection; | | | | | | | |
| LA.1112.1.7.4 | The student will identify cause-and-effect relationships in text; | | | | | | | |
| LA.1112.3.1.2 | The student will prewrite by making a plan for writing that addresses purpose, audience, a controlling idea, logical sequence, and time frame for completion; and | | | | | | | |
| LA.1112.3.1.3 | The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style. | | | | | | | |
| LA.1112.3.2.2 | The student will draft writing by establishing a logical organizational pattern with supporting details that are substantial, specific, and relevant; and | | | | | | | |
| MA.912.A.4.5 | Graph polynomial functions with and without technology and describe end behavior. | | | | | | | |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology. | | | | | | | |
| MA.912.A.4.9 | Use graphing technology to find approximate solutions for polynomial equations. | | | | | | | |
| MA.912.A.5.6 | Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function. | | | | | | | |
| MA.912.A.8.7 | Solve applications of exponential growth and decay. | | | | | | | |
| MA.912.A.9.1 | Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.). | | | | | | | |
| MA.912.A.9.2 | Graph conic sections with and without using graphing technology. | | | | | | | |
| MA.912.A.9.3 | Solve real-world problems involving conic sections | | | | | | | |
| MA.912.D.10.1 | Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion. | | | | | | | |
| MA.912.D.10.2 | Convert from a parametric representation of a plane curve to a rectangular equation, and vice-versa. | | | | | | | |
| MA.912.D.10.3 | Use parametric equations to model applications of motion in the plane. | | | | | | | |
| MA.912.D.6.4 | Use methods of direct and indirect proof and determine whether a short proof is logically valid. | | | | | | | |

| OVERALL INSTRUCTIONAL QUALITY | IDENTIFY AN EXAMPLE (WITH PAGE NUMBERS) DEEMED TYPICAL OF THE APPROACH TAKEN IN THE MAJOR TOOL.<br>The Examples can be from Student or Teacher Instructional Material. | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| The major tool introduces and builds mathematical concepts as a coherent whole. It provides opportunities to students to explore why a mathematical idea is important and in which contexts that mathematical idea can be useful. In other words, the major tool helps students learn the mathematics concepts in depth. Additionally, students are given opportunities to connect conceptual knowledge with procedural knowledge and factual knowledge. Overall, there is an appropriate balance of skill development and conceptual understanding. | | | | | |
| Tasks are engaging and interesting enough that students want to pursue them. Real world problems are realistic and relevant to students' lives. | | | | | |
| Problem solving is encouraged by the tasks presented to students. Tasks require students to make decisions, determine strategies, and justify solutions. | | | | | |
| Tasks engage students in communicating mathematical ideas by writing, explaining, drawing, using symbols, talking, listening, and reading for information. Tasks encourage collaboration, discussion, individual accountability, and positive interdependence. | | | | | |
| Students are given opportunities to create and use representations to organize, record, and communicate their thinking.<br>Tasks promote use of multiple representations and translations among them. Students use a variety of tools to understand a single concept. | | | | | |
| The mathematics connects to other disciplines such as reading, art, science, and history. Tasks represent mathematical ideas as interconnected and building upon each other. | | | | | |
| Tasks require students to make conjectures, justify their thinking, defend their responses by using mathematical arguments, and prove mathematical statements. Students are encouraged to invent and justify solution methods. Students analyze correct and incorrect solution methods. | | | | | |