



## Grade 3 Accelerated Mathematics

### Version Description

In Grade 3 Accelerated Mathematics, instructional time will emphasize five areas:

- (1) extending understanding of place value in multi-digit whole numbers;
- (2) adding and subtracting multi-digit whole numbers, including using a standard algorithm;
- (3) building an understanding of multiplication and division, the relationship between them and the connection to area of rectangles;
- (4) developing an understanding of fractions and
- (5) extending geometric reasoning to lines, angles and attributes of quadrilaterals.

Curricular content for all subjects must integrate critical-thinking, problem-solving, and workforce-literacy skills; communication, reading, and writing skills; mathematics skills; collaboration skills; contextual and applied-learning skills; technology-literacy skills; information and media-literacy skills; and civic-engagement skills.

*All clarifications stated, whether general or specific to Grade 3 Accelerated Mathematics, are expectations for instruction of that benchmark.*

### General Notes

Honors and Accelerated Level Course Note: Accelerated courses require a greater demand on students through increased academic rigor. Academic rigor is obtained through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted. Students are challenged to think and collaborate critically on the content they are learning. Honors level rigor will be achieved by increasing text complexity through text selection, focus on high-level qualitative measures, and complexity of task. Instruction will be structured to give students a deeper understanding of conceptual themes and organization within and across disciplines. Academic rigor is more than simply assigning to students a greater quantity of work.

Florida's Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards: This course includes Florida's B.E.S.T. ELA Expectations (EE) and Mathematical Thinking and Reasoning Standards (MTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable. For guidance on the implementation of the EEs and MTRs, please visit [https://www.cpalms.org/Standards/BEST\\_Standards.aspx](https://www.cpalms.org/Standards/BEST_Standards.aspx) and select the appropriate B.E.S.T. Standards package.

English Language Development ELD Standards Special Notes Section: Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an



ELL supporting document which delineates performance definitions and descriptors, please click on the following link: <http://www.cpalms.org/uploads/docs/standards/eld/MA.pdf>

### General Information

Course Number: 5012055	Course Type: Core Academic Course
Course Length: Year (Y)	Course Level: 3
Course Attributes: Honors, Class Size Core Required	Grade Level(s): 3, 4
Course Path: Section   Grades PreK to 12 Education Courses > Grade Group   Grades PreK to 5 Education Courses > Subject   Mathematics > SubSubject   General Mathematics > Abbreviated Title   GR 3 ACCELL MATH	
Educator Certification: Elementary Education (Elementary Grades 1-6) or Elementary Education (Grades K-6) or Mathematics (Elementary Grades 1-6)	

### Course Standards and Benchmarks

#### Mathematical Thinking and Reasoning

***MA.K12.MTR.1.1 Actively participate in effortful learning both individually and collectively.***

Mathematicians who participate in effortful learning both individually and with others:

- Analyze the problem in a way that makes sense given the task.
- Ask questions that will help with solving the task.
- Build perseverance by modifying methods as needed while solving a challenging task.
- Stay engaged and maintain a positive mindset when working to solve tasks.
- Help and support each other when attempting a new method or approach.

#### Clarifications:

Teachers who encourage students to participate actively in effortful learning both individually and with others:

- Cultivate a community of growth mindset learners.
- Foster perseverance in students by choosing tasks that are challenging.
- Develop students' ability to analyze and problem solve.
- Recognize students' effort when solving challenging problems.



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***MA.K12.MTR.2.1 Demonstrate understanding by representing problems in multiple ways.***

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Mathematicians who demonstrate understanding by representing problems in multiple ways:

- Build understanding through modeling and using manipulatives.
- Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.
- Progress from modeling problems with objects and drawings to using algorithms and equations.
- Express connections between concepts and representations.
- Choose a representation based on the given context or purpose.

Clarifications:

Teachers who encourage students to demonstrate understanding by representing problems in multiple ways:

- Help students make connections between concepts and representations.
- Provide opportunities for students to use manipulatives when investigating concepts.
- Guide students from concrete to pictorial to abstract representations as understanding progresses.
- Show students that various representations can have different purposes and can be useful in different situations.

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***MA.K12.MTR.3.1 Complete tasks with mathematical fluency.***

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Mathematicians who complete tasks with mathematical fluency:

- Select efficient and appropriate methods for solving problems within the given context.
- Maintain flexibility and accuracy while performing procedures and mental calculations.
- Complete tasks accurately and with confidence.
- Adapt procedures to apply them to a new context.
- Use feedback to improve efficiency when performing calculations.

Clarifications:

Teachers who encourage students to complete tasks with mathematical fluency:

- Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately.
  - Offer multiple opportunities for students to practice efficient and generalizable methods.
  - Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
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***MA.K12.MTR.4.1 Engage in discussions that reflect on the mathematical thinking of self and others.***

Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:

- Communicate mathematical ideas, vocabulary and methods effectively.
- Analyze the mathematical thinking of others.
- Compare the efficiency of a method to those expressed by others.
- Recognize errors and suggest how to correctly solve the task.
- Justify results by explaining methods and processes.
- Construct possible arguments based on evidence.

Clarifications:

Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

- Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
- Create opportunities for students to discuss their thinking with peers.
- Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
- Develop students' ability to justify methods and compare their responses to the responses of their peers.

***MA.K12.MTR.5.1 Use patterns and structure to help understand and connect mathematical concepts.***

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated large-scale situations.

Clarifications:

Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
- Provide opportunities for students to create plans and procedures to solve problems.
- Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.



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***MA.K12.MTR.6.1 Assess the reasonableness of solutions.***

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Mathematicians who assess the reasonableness of solutions:

- Estimate to discover possible solutions.
- Use benchmark quantities to determine if a solution makes sense.
- Check calculations when solving problems.
- Verify possible solutions by explaining the methods used.
- Evaluate results based on the given context.

Clarifications:

Teachers who encourage students to assess the reasonableness of solutions:

- Have students estimate or predict solutions prior to solving.
- Prompt students to continually ask, “Does this solution make sense? How do you know?”
- Reinforce that students check their work as they progress within and after a task.
- Strengthen students’ ability to verify solutions through justifications.

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***MA.K12.MTR.7.1 Apply mathematics to real-world contexts.***

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Mathematicians who apply mathematics to real-world contexts:

- Connect mathematical concepts to everyday experiences.
- Use models and methods to understand, represent and solve problems.
- Perform investigations to gather data or determine if a method is appropriate.
- Redesign models and methods to improve accuracy or efficiency.

Clarifications:

Teachers who encourage students to apply mathematics to real-world contexts:

- Provide opportunities for students to create models, both concrete and abstract, and perform investigations.
- Challenge students to question the accuracy of their models and methods.
- Support students as they validate conclusions by comparing them to the given situation.
- Indicate how various concepts can be applied to other disciplines.

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**ELA Expectations**

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***ELA.K12.EE.1.1 Cite evidence to explain and justify reasoning.***

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***ELA.K12.EE.2.1 Read and comprehend grade-level complex texts proficiently.***

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***ELA.K12.EE.3.1 Make inferences to support comprehension.***

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***ELA.K12.EE.4.1 Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations.***

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***ELA.K12.EE.5.1 Use the accepted rules governing a specific format to create quality work.***

***ELA.K12.EE.6.1 Use appropriate voice and tone when speaking or writing.***

## English Language Development

***ELD.K12.ELL.MA Language of Mathematics***

**ELD.K12.ELL.MA.1** English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

## Number Sense and Operations

***MA.3.NSO.1 Understand the place value of four-digit numbers.***

**MA.3.NSO.1.1** Read and write numbers from 0 to 10,000 using standard form, expanded form and word form.

*Example:* The number two thousand five hundred thirty written in standard form is 2,530 and in expanded form is  $2,000 + 500 + 30$ .

**MA.3.NSO.1.2** Compose and decompose four-digit numbers in multiple ways using thousands, hundreds, tens and ones. Demonstrate each composition or decomposition using objects, drawings and expressions or equations.

*Example:* The number 5,783 can be expressed as  $5 \text{ thousands} + 7 \text{ hundreds} + 8 \text{ tens} + 3 \text{ ones}$  or as  $56 \text{ hundreds} + 183 \text{ ones}$ .

**MA.3.NSO.1.3** Plot, order and compare whole numbers up to 10,000.

*Example:* The numbers 3,475; 4,743 and 4,753 can be arranged in ascending order as 3,475; 4,743 and 4,753.

### Benchmark Clarifications:

*Clarification 1:* When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the thousands, hundreds, tens and ones digits.

*Clarification 2:* Number lines, scaled by 50s, 100s or 1,000s, must be provided and can be a representation of any range of numbers.

*Clarification 3:* Within this benchmark, the expectation is to use symbols ( $<$ ,  $>$  or  $=$ ).



MA.3.NSO.1.4 Round whole numbers from 0 to 1,000 to the nearest 10 or 100.

*Example:* The number 775 is rounded to 780 when rounded to the nearest 10.

*Example:* The number 745 is rounded to 700 when rounded to the nearest 100.

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**MA.3.NSO.2 Add and subtract multi-digit whole numbers. Build an understanding of multiplication and division operations.**

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MA.3.NSO.2.1 Add and subtract multi-digit whole numbers including using a standard algorithm with procedural fluency.

MA.3.NSO.2.2 Explore multiplication of two whole numbers with products from 0 to 144, and related division facts.

Benchmark Clarifications:

*Clarification 1:* Instruction includes equal groups, arrays, area models and equations.

*Clarification 2:* Within the benchmark, it is the expectation that one problem can be represented in multiple ways and understanding how the different representations are related to each other.

*Clarification 3:* Factors and divisors are limited to up to 12.

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MA.3.NSO.2.3 Multiply a one-digit whole number by a multiple of 10, up to 90, or a multiple of 100, up to 900, with procedural reliability.

*Example:* The product of 6 and 70 is 420.

*Example:* The product of 6 and 300 is 1,800.

Benchmark Clarifications:

*Clarification 1:* When multiplying one-digit numbers by multiples of 10 or 100, instruction focuses on methods that are based on place value.

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MA.3.NSO.2.4 Multiply two whole numbers from 0 to 12 and divide using related facts with procedural reliability.

*Example:* The product of 5 and 6 is 30.

*Example:* The quotient of 27 and 9 is 3.

Benchmark Clarifications:

*Clarification 1:* Instruction focuses on helping a student choose a method they can use reliably.

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**MA.4.NSO.1 Understand place value for multi-digit numbers.**

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MA.4.NSO.1.2 Read and write multi-digit whole numbers from 0 to 1,000,000 using standard form, expanded form and word form.

*Example:* The number two hundred seventy-five thousand eight hundred two written in standard form is 275,802 and in expanded form is  $200,000 + 70,000 + 5,000 + 800 + 2$  or  $(2 \times 100,000) + (7 \times 10,000) + (5 \times 1,000) + (8 \times 100) + (2 \times 1)$ .





MA.4.NSO.1.3 Plot, order and compare multi-digit whole numbers up to 1,000,000.

*Example:* The numbers 75,421; 74,241 and 74,521 can be arranged in ascending order as 74,241; 74,521 and 75,421.

**Benchmark Clarifications:**

*Clarification 1:* When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the hundred thousands, ten thousands, thousands, hundreds, tens and ones digits.

*Clarification 2:* Scaled number lines must be provided and can be a representation of any range of numbers.

*Clarification 3:* Within this benchmark, the expectation is to use symbols ( $<$ ,  $>$  or  $=$ ).

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MA.4.NSO.1.4 Round whole numbers from 0 to 10,000 to the nearest 10, 100 or 1,000.

*Example:* The number 6,325 is rounded to 6,300 when rounded to the nearest 100.

*Example:* The number 2,550 is rounded to 3,000 when rounded to the nearest 1,000.

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***MA.4.NSO.2 Build an understanding of operations with multi-digit numbers including decimals.***

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MA.4.NSO.2.1 Recall multiplication facts with factors up to 12 and related division facts with automaticity.

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MA.4.NSO.2.2 Multiply two whole numbers, up to three digits by up to two digits, with procedural reliability.

**Benchmark Clarifications:**

*Clarification 1:* Instruction focuses on helping a student choose a method they can use reliably.

*Clarification 2:* Instruction includes the use of models or equations based on place value and the distributive property.

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MA.4.NSO.2.5 Explore the multiplication and division of multi-digit whole numbers using estimation, rounding and place value.

*Example:* The product of 215 and 460 can be estimated as being between 80,000 and 125,000 because it is bigger than  $200 \times 400$  but smaller than  $250 \times 500$ .

*Example:* The quotient of 1,380 and 27 can be estimated as 50 because 27 is close to 30 and 1,380 is close to 1,500. 1,500 divided by 30 is the same as 150 *tens* divided by 3 *tens* which is 5 *tens*, or 50.

**Benchmark Clarifications:**

*Clarification 1:* Instruction focuses on previous understanding of multiplication with multiples of 10 and 100, and seeing division as a missing factor problem.

*Clarification 2:* Estimating quotients builds the foundation for division using a standard algorithm.

*Clarification 3:* When estimating the division of whole numbers, dividends are limited to up to four digits and divisors are limited to up to two digits.





## Fractions

### **MA.3.FR.1 Understand fractions as numbers and represent fractions.**

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MA.3.FR.1.1 Represent and interpret unit fractions in the form  $\frac{1}{n}$  as the quantity formed by one part when a whole is partitioned into  $n$  equal parts.

*Example:*  $\frac{1}{4}$  can be represented as  $\frac{1}{4}$  of a pie (parts of a shape), as 1 out of 4 trees (parts of a set) or as  $\frac{1}{4}$  on the number line.

**Benchmark Clarifications:**

*Clarification 1:* This benchmark emphasizes conceptual understanding through the use of manipulatives or visual models.

*Clarification 2:* Instruction focuses on representing a unit fraction as part of a whole, part of a set, a point on a number line, a visual model or in fractional notation.

*Clarification 3:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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MA.3.FR.1.2 Represent and interpret fractions, including fractions greater than one, in the form of  $\frac{m}{n}$  as the result of adding the unit fraction  $\frac{1}{n}$  to itself  $m$  times.

*Example:*  $\frac{9}{8}$  can be represented as  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ .

**Benchmark Clarifications:**

*Clarification 1:* Instruction emphasizes conceptual understanding through the use of manipulatives or visual models, including circle graphs, to represent fractions.

*Clarification 2:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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MA.3.FR.1.3 Read and write fractions, including fractions greater than one, using standard form, numeral-word form and word form.

*Example:* The fraction  $\frac{4}{3}$  written in word form is four-thirds and in numeral-word form is 4 *thirds*.

**Benchmark Clarifications:**

*Clarification 1:* Instruction focuses on making connections to reading and writing numbers to develop the understanding that fractions are numbers and to support algebraic thinking in later grades.

*Clarification 2:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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**MA.3.FR.2 Order and compare fractions and identify equivalent fractions.**

MA.3.FR.2.1 Plot, order and compare fractional numbers with the same numerator or the same denominator.

*Example:* The fraction  $\frac{3}{2}$  is to the right of the fraction  $\frac{3}{3}$  on a number line so  $\frac{3}{2}$  is greater than  $\frac{3}{3}$ .

Benchmark Clarifications:

*Clarification 1:* Instruction includes making connections between using a ruler and plotting and ordering fractions on a number line.

*Clarification 2:* When comparing fractions, instruction includes an appropriately scaled number line and using reasoning about their size.

*Clarification 3:* Fractions include fractions greater than one, including mixed numbers, with denominators limited to 2, 3, 4, 5, 6, 8, 10 and 12.

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MA.3.FR.2.2 Identify equivalent fractions and explain why they are equivalent.

*Example:* The fractions  $\frac{1}{1}$  and  $\frac{3}{3}$  can be identified as equivalent using number lines.

*Example:* The fractions  $\frac{2}{4}$  and  $\frac{2}{6}$  can be identified as not equivalent using a visual model.

Benchmark Clarifications:

*Clarification 1:* Instruction includes identifying equivalent fractions and explaining why they are equivalent using manipulatives, drawings, and number lines.

*Clarification 2:* Within this benchmark, the expectation is not to generate equivalent fractions.

*Clarification 3:* Fractions are limited to fractions less than or equal to one with denominators of 2, 3, 4, 5, 6, 8, 10 and 12. Number lines must be given and scaled appropriately.

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**MA.4.FR.1 Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.**

MA.4.FR.1.1 Model and express a fraction, including mixed numbers and fractions greater than one, with the denominator 10 as an equivalent fraction with the denominator 100.

Benchmark Clarifications:

*Clarification 1:* Instruction emphasizes conceptual understanding through the use of manipulatives, visual models, number lines or equations.

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MA.4.FR.1.3 Identify and generate equivalent fractions, including fractions greater than one. Describe how the numerator and denominator are affected when the equivalent fraction is created.

Benchmark Clarifications:

*Clarification 1:* Instruction includes the use of manipulatives, visual models, number lines or equations.

*Clarification 2:* Instruction includes recognizing how the numerator and denominator are affected when equivalent fractions are generated.



MA.4.FR.1.4 Plot, order and compare fractions, including mixed numbers and fractions greater than one, with different numerators and different denominators.

*Example:*  $1\frac{2}{3} > 1\frac{1}{4}$  because  $\frac{2}{3}$  is greater than  $\frac{1}{2}$  and  $\frac{1}{2}$  is greater than  $\frac{1}{4}$ .

**Benchmark Clarifications:**

*Clarification 1:* When comparing fractions, instruction includes using an appropriately scaled number line and using reasoning about their size.

*Clarification 2:* Instruction includes using benchmark quantities, such as  $0$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and  $1$ , to compare fractions.

*Clarification 3:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.

*Clarification 4:* Within this benchmark, the expectation is to use symbols ( $<$ ,  $>$  or  $=$ ).

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***MA.4.FR.2 Build a foundation of addition, subtraction and multiplication operations with fractions.***

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MA.4.FR.2.1 Decompose a fraction, including mixed numbers and fractions greater than one, into a sum of fractions with the same denominator in multiple ways. Demonstrate each decomposition with objects, drawings and equations.

*Example:*  $\frac{9}{8}$  can be decomposed as  $\frac{8}{8} + \frac{1}{8}$  or as  $\frac{3}{8} + \frac{3}{8} + \frac{3}{8}$ .

**Benchmark Clarifications:**

*Clarification 1:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.

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MA.4.FR.2.2 Add and subtract fractions with like denominators, including mixed numbers and fractions greater than one, with procedural reliability.

*Example:* The difference  $\frac{9}{5} - \frac{4}{5}$  can be expressed as 9 *fifths* minus 4 *fifths* which is 5 *fifths*, or *one*.

**Benchmark Clarifications:**

*Clarification 1:* Instruction includes the use of word form, manipulatives, drawings, the properties of operations or number lines.

*Clarification 2:* Within this benchmark, the expectation is not to simplify or use lowest terms.

*Clarification 3:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.

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MA.4.FR.2.3 Explore the addition of a fraction with denominator of 10 to a fraction with denominator of 100 using equivalent fractions.

*Example:*  $\frac{9}{100} + \frac{3}{10}$  is equivalent to  $\frac{9}{100} + \frac{30}{100}$  which is equivalent to  $\frac{39}{100}$ .

**Benchmark Clarifications:**

*Clarification 1:* Instruction includes the use of visual models.

*Clarification 2:* Within this benchmark, the expectation is not to simplify or use lowest terms.

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## Algebraic Reasoning

### ***MA.3.AR.1 Solve multiplication and division problems.***

MA.3.AR.1.1 Apply the distributive property to multiply a one-digit number and two-digit number. Apply properties of multiplication to find a product of one-digit whole numbers.

*Example:* The product  $4 \times 72$  can be found by rewriting the expression as  $4 \times (70 + 2)$  and then using the distributive property to obtain  $(4 \times 70) + (4 \times 2)$  which is equivalent to 288.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is to apply the associative and commutative properties of multiplication, the distributive property and name the properties. Refer to K-12 Glossary (Appendix C).

*Clarification 2:* Within the benchmark, the expectation is to utilize parentheses.

*Clarification 3:* Multiplication for products of three or more numbers is limited to factors within 12. Refer to Properties of Operations, Equality and Inequality (Appendix D).

MA.3.AR.1.2 Solve one- and two-step real-world problems involving any of four operations with whole numbers.

*Example:* A group of students are playing soccer during lunch. How many students are needed to form four teams with eleven players each and to have two referees?

Benchmark Clarifications:

*Clarification 1:* Instruction includes understanding the context of the problem, as well as the quantities within the problem.

*Clarification 2:* Multiplication is limited to factors within 12 and related division facts. Refer to Situations Involving Operations with Numbers (Appendix A).

### ***MA.3.AR.2 Develop an understanding of equality and multiplication and division.***

MA.3.AR.2.1 Restate a division problem as a missing factor problem using the relationship between multiplication and division.

*Example:* The equation  $56 \div 7 = ?$  can be restated as  $7 \times ? = 56$  to determine the quotient is 8.

Benchmark Clarifications:

*Clarification 1:* Multiplication is limited to factors within 12 and related division facts.

*Clarification 2:* Within this benchmark, the symbolic representation of the missing factor uses any symbol or a letter.



MA.3.AR.2.2 Determine and explain whether an equation involving multiplication or division is true or false.

*Example:* Given the equation  $27 \div 3 = 3 \times 3$ , it can be determined to be a true equation by dividing the numbers on the left side of the equal sign and multiplying the numbers on the right of the equal sign to see that both sides are equivalent to 9.

Benchmark Clarifications:

*Clarification 1:* Instruction extends the understanding of the meaning of the equal sign to multiplication and division.

*Clarification 2:* Problem types are limited to an equation with three or four terms. The product or quotient can be on either side of the equal sign.

*Clarification 3:* Multiplication is limited to factors within 12 and related division facts.

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MA.3.AR.2.3 Determine the unknown whole number in a multiplication or division equation, relating three whole numbers, with the unknown in any position.

Benchmark Clarifications:

*Clarification 1:* Instruction extends the development of algebraic thinking skills where the symbolic representation of the unknown uses any symbol or a letter.

*Clarification 2:* Problems include the unknown on either side of the equal sign.

*Clarification 3:* Multiplication is limited to factors within 12 and related division facts. Refer to Situations Involving Operations with Numbers (Appendix A).

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***MA.3.AR.3 Identify numerical patterns, including multiplicative patterns.***

MA.3.AR.3.1 Determine and explain whether a whole number from 1 to 1,000 is even or odd.

Benchmark Clarifications:

*Clarification 1:* Instruction includes determining and explaining using place value and recognizing patterns.

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MA.3.AR.3.2 Determine whether a whole number from 1 to 144 is a multiple of a given one-digit number.

Benchmark Clarifications:

*Clarification 1:* Instruction includes determining if a number is a multiple of a given number by using multiplication or division.

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MA.3.AR.3.3 Identify, create and extend numerical patterns.

*Example:* Bailey collects 6 baseball cards every day. This generates the pattern 6, 12, 18, ... How many baseball cards will Bailey have at the end of the sixth day?

Benchmark Clarifications:

*Clarification 1:* The expectation is to use ordinal numbers (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, ...) to describe the position of a number within a sequence.

*Clarification 2:* Problem types include patterns involving addition, subtraction, multiplication or division of whole numbers.

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***MA.4.AR.1 Represent and solve problems involving the four operations with whole numbers and fractions.***

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MA.4.AR.1.2 Solve real-world problems involving addition and subtraction of fractions with like denominators, including mixed numbers and fractions greater than one.

*Example:* Megan is making pies and uses the equation  $1\frac{3}{4} + 3\frac{1}{4} = x$  when baking. Describe a situation that can represent this equation.

*Example:* Clay is running a 10K race. So far, he has run  $6\frac{1}{5}$  kilometers. How many kilometers does he have remaining?

Benchmark Clarifications:

*Clarification 1:* Problems include creating real-world situations based on an equation or representing a real-world problem with a visual model or equation.

*Clarification 2:* Fractions within problems must reference the same whole.

*Clarification 3:* Within this benchmark, the expectation is not to simplify or use lowest terms.

*Clarification 4:* Denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.

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***MA.4.AR.2 Demonstrate an understanding of equality and operations with whole numbers.***

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MA.4.AR.2.1 Determine and explain whether an equation involving any of the four operations with whole numbers is true or false.

*Example:* The equation  $32 \div 8 = 32 - 8 - 8 - 8 - 8$  can be determined to be false because the expression on the left side of the equal sign is not equivalent to the expression on the right side of the equal sign.

Benchmark Clarifications:

*Clarification 1:* Multiplication is limited to whole number factors within 12 and related division facts.

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MA.4.AR.2.2 Given a mathematical or real-world context, write an equation involving multiplication or division to determine the unknown whole number with the unknown in any position.

*Example:* The equation  $96 = 8 \times t$  can be used to determine the cost of each movie ticket at the movie theatre if a total of \$96 was spent on 8 equally priced tickets. Then each ticket costs \$12.

Benchmark Clarifications:

*Clarification 1:* Instruction extends the development of algebraic thinking skills where the symbolic representation of the unknown uses a letter.

*Clarification 2:* Problems include the unknown on either side of the equal sign.

*Clarification 3:* Multiplication is limited to factors within 12 and related division facts.

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**MA.4.AR.3 Recognize numerical patterns, including patterns that follow a given rule.**

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MA.4.AR.3.1 Determine factor pairs for a whole number from 0 to 144. Determine whether a whole number from 0 to 144 is prime, composite or neither.

Benchmark Clarifications:

*Clarification 1:* Instruction includes the connection to the relationship between multiplication and division and patterns with divisibility rules.

*Clarification 2:* The numbers 0 and 1 are neither prime nor composite.

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MA.4.AR.3.2 Generate, describe and extend a numerical pattern that follows a given rule.

*Example:* Generate a pattern of four numbers that follows the rule of adding 14 starting at 5.

Benchmark Clarifications:

*Clarification 1:* Instruction includes patterns within a mathematical or real-world context.

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## Measurement

**MA.3.M.1 Measure attributes of objects and solve problems involving measurement.**

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MA.3.M.1.1 Select and use appropriate tools to measure the length of an object, the volume of liquid within a beaker and temperature.

Benchmark Clarifications:

*Clarification 1:* Instruction focuses on identifying measurement on a linear scale, making the connection to the number line.

*Clarification 2:* When measuring the length, limited to the nearest centimeter and half or quarter inch.

*Clarification 3:* When measuring the temperature, limited to the nearest degree.

*Clarification 4:* When measuring the volume of liquid, limited to nearest milliliter and half or quarter cup.

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MA.3.M.1.2 Solve real-world problems involving any of the four operations with whole-number lengths, masses, weights, temperatures or liquid volumes.

*Example:* Ms. Johnson's class is having a party. Eight students each brought in a 2-liter bottle of soda for the party. How many liters of soda did the class have for the party?

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, it is the expectation that responses include appropriate units.

*Clarification 2:* Problem types are not expected to include measurement conversions.

*Clarification 3:* Instruction includes the comparison of attributes measured in the same units.

*Clarification 4:* Units are limited to yards, feet, inches; meters, centimeters; pounds, ounces; kilograms, grams; degrees Fahrenheit, degrees Celsius; gallons, quarts, pints, cups; and liters, milliliters.

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**MA.3.M.2 Tell and write time and solve problems involving time.**

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MA.3.M.2.1 Using analog and digital clocks tell and write time to the nearest minute using a.m. and p.m. appropriately.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is not to understand military time.

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MA.3.M.2.2 Solve one- and two-step real-world problems involving elapsed time.

*Example:* A bus picks up Kimberly at 6:45 a.m. and arrives at school at 8:15 a.m. How long was her bus ride?

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is not to include crossing between a.m. and p.m.

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## Geometric Reasoning

**MA.3.GR.1 Describe and identify relationships between lines and classify quadrilaterals.**

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MA.3.GR.1.1 Describe and draw points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines. Identify these in two-dimensional figures.

Benchmark Clarifications:

*Clarification 1:* Instruction includes mathematical and real-world context for identifying points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines.

*Clarification 2:* When working with perpendicular lines, right angles can be called square angles or square corners.

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- MA.3.GR.1.2 Identify and draw quadrilaterals based on their defining attributes. Quadrilaterals include parallelograms, rhombi, rectangles, squares and trapezoids.

Benchmark Clarifications:

*Clarification 1:* Instruction includes a variety of quadrilaterals and a variety of non-examples that lack one or more defining attributes when identifying quadrilaterals.

*Clarification 2:* Quadrilaterals will be filled, outlined or both when identifying.

*Clarification 3:* Drawing representations must be reasonably accurate.

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- MA.3.GR.1.3 Draw line(s) of symmetry in a two-dimensional figure and identify line-symmetric two-dimensional figures.

Benchmark Clarifications:

*Clarification 1:* Instruction develops the understanding that there could be no line of symmetry, exactly one line of symmetry or more than one line of symmetry.

*Clarification 2:* Instruction includes folding paper along a line of symmetry so that both halves match exactly to confirm line-symmetric figures.

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**MA.3.GR.2 Solve problems involving the perimeter and area of rectangles.**

- MA.3.GR.2.1 Explore area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps. Find areas of rectangles by counting unit squares.

Benchmark Clarifications:

*Clarification 1:* Instruction emphasizes the conceptual understanding that area is an attribute that can be measured for a two-dimensional figure. The measurement unit for area is the area of a unit square, which is a square with side length of 1 unit.

*Clarification 2:* Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form (e.g., square centimeter or sq.cm.).

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- MA.3.GR.2.2 Find the area of a rectangle with whole-number side lengths using a visual model and a multiplication formula.

Benchmark Clarifications:

*Clarification 1:* Instruction includes covering the figure with unit squares, a rectangular array or applying a formula.

*Clarification 2:* Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form.

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- MA.3.GR.2.3 Solve mathematical and real-world problems involving the perimeter and area of rectangles with whole-number side lengths using a visual model and a formula.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is not to find unknown side lengths.

*Clarification 2:* Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form.



- MA.3.GR.2.4 Solve mathematical and real-world problems involving the perimeter and area of composite figures composed of non-overlapping rectangles with whole-number side lengths.

*Example:* A pool is comprised of two non-overlapping rectangles in the shape of an “L”. The area for a cover of the pool can be found by adding the areas of the two non-overlapping rectangles.

**Benchmark Clarifications:**

*Clarification 1:* Composite figures must be composed of non-overlapping rectangles.

*Clarification 2:* Each rectangle within the composite figure cannot exceed 12 units by 12 units and responses include the appropriate units in word form.

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***MA.4.GR.1 Draw, classify and measure angles.***

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- MA.4.GR.1.1 Informally explore angles as an attribute of two-dimensional figures. Identify and classify angles as acute, right, obtuse, straight or reflex.

**Benchmark Clarifications:**

*Clarification 1:* Instruction includes classifying angles using benchmark angles of  $90^\circ$  and  $180^\circ$  in two-dimensional figures.

*Clarification 2:* When identifying angles, the expectation includes two-dimensional figures and real-world pictures.

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- MA.4.GR.1.2 Estimate angle measures. Using a protractor, measure angles in whole-number degrees and draw angles of specified measure in whole-number degrees. Demonstrate that angle measure is additive.

**Benchmark Clarifications:**

*Clarification 1:* Instruction includes measuring given angles and drawing angles using protractors.

*Clarification 2:* Instruction includes estimating angle measures using benchmark angles ( $30^\circ$ ,  $45^\circ$ ,  $60^\circ$ ,  $90^\circ$  and  $180^\circ$ ).

*Clarification 3:* Instruction focuses on the understanding that angles can be decomposed into non-overlapping angles whose measures sum to the measure of the original angle.

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- MA.4.GR.1.3 Solve real-world and mathematical problems involving unknown whole-number angle measures. Write an equation to represent the unknown.

*Example:* A  $60^\circ$  angle is decomposed into two angles, one of which is  $25^\circ$ . What is the measure of the other angle?

**Benchmark Clarifications:**

*Clarification 1:* Instruction includes the connection to angle measure as being additive.

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***MA.4.GR.2 Solve problems involving the perimeter and area of rectangles.***

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MA.4.GR.2.1 Solve perimeter and area mathematical and real-world problems, including problems with unknown sides, for rectangles with whole-number side lengths.

Benchmark Clarifications:

*Clarification 1:* Instruction extends the development of algebraic thinking where the symbolic representation of the unknown uses a letter.

*Clarification 2:* Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit.

*Clarification 3:* Responses include the appropriate units in word form.

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MA.4.GR.2.2 Solve problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters.

*Example:* Possible dimensions of a rectangle with an area of 24 square feet include 6 feet by 4 feet or 8 feet by 3 feet. This can be found by cutting a rectangle into unit squares and rearranging them.

Benchmark Clarifications:

*Clarification 1:* Instruction focuses on the conceptual understanding of the relationship between perimeter and area.

*Clarification 2:* Within this benchmark, rectangles are limited to having whole-number side lengths.

*Clarification 3:* Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit.

*Clarification 4:* Responses include the appropriate units in word form.

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## Data Analysis and Probability

***MA.3.DP.1 Collect, represent and interpret numerical and categorical data.***

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MA.3.DP.1.1 Collect and represent numerical and categorical data with whole-number values using tables, scaled pictographs, scaled bar graphs or line plots. Use appropriate titles, labels and units.

Benchmark Clarifications:

*Clarification 1:* Within this benchmark, the expectation is to complete a representation or construct a representation from a data set.

*Clarification 2:* Instruction includes the connection between multiplication and the number of data points represented by a bar in scaled bar graph or a scaled column in a pictograph.

*Clarification 3:* Data displays are represented both horizontally and vertically.

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MA.3.DP.1.2 Interpret data with whole-number values represented with tables, scaled pictographs, circle graphs, scaled bar graphs or line plots by solving one- and two-step problems.

**Benchmark Clarifications:**

*Clarification 1:* Problems include the use of data in informal comparisons between two data sets in the same units.

*Clarification 2:* Data displays can be represented both horizontally and vertically.

*Clarification 3:* Circle graphs are limited to showing the total values in each category.

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