COMPETENCIES AND SKILLS

REQUIRED FOR

TEACHER CERTIFICATION

IN FLORIDA

TWENTY-SEVENTH EDITION

Florida Department of Education
www.fldoe.org

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Competencies and Skills Required for Teacher Certification in Florida
Twenty-Seventh Edition

Introduction

Effective July 1, 1988, the Florida Legislature expanded the Florida Teacher Certification Examination (FTCE) to include tests of subject matter knowledge in the certification areas (Section 1012.56, Florida Statutes).

On March 28, 1989, the State Board of Education amended Rule 6A-4.0021, Florida Administrative Code (F.A.C.), to include revised competencies and skills for the professional skills part of the FTCE and new competencies and skills for the subject area examinations in the following certification areas:

- Biology 6–12
- Computer Science K–12
- Earth-Space Science 6–12
- Emotionally Handicapped K–12
- Geography 6–12
- Guidance and Counseling PK–12
- History 6–12
- Journalism 6–12
- Mentally Handicapped K–12
- Physical Education K–8
- Physical Education 6–12
- Physically Impaired K–12
- Political Science 6–12
- Reading K–12
- School Psychologist PK–12
- Specific Learning Disabilities K–12
- Speech-Language Impaired K–12
- Varying Exceptionalities K–12

This was printed as *Competencies and Skills Required for Teacher Certification in Florida.*

On March 13, 1990, the State Board of Education amended the rule to include competencies and skills in the following additional certification areas:

- Art K–12
- Chemistry 6–12
- Drama 6–12
- Economics 6–12
- Educational Media Specialist PK–12
- Elementary Education 1–6
- English 6–12
- French K–12
- German K–12
- Health K–12
- Hearing Impaired K–12
- Latin K–12
- Mathematics 6–12
- Middle Grades English 5–9
- Middle Grades General Science 5–9
- Middle Grades Mathematics 5–9
- Middle Grades Social Science 5–9
- Music K–12
- Physics 6–12
- Primary Education K–3
- Social Science 6–12
- Spanish K–12
- Speech 6–12

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Second Edition.*

On March 26, 1991, the State Board of Education amended the rule to include competencies and skills in the following additional certification areas:

- Business Education 6–12
- Home Economics 6–12
- Humanities K–12
- Occupational Specialist
- Preschool Education N–PK
- Psychology 6–12
- Sociology 6–12
- Visually Impaired K–12

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Third Edition.*

On October 26, 1993, the State Board of Education amended the rule to include competencies and skills in the following additional certification areas:

- English to Speakers of Other Languages K–12
- Prekindergarten/Primary PK–3
- Preschool Education (Birth–Age 4) (a revision of the previous Preschool Education N–PK)

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Fourth Edition.*

On March 16, 1995, the State Board of Education amended the rule to include competencies and skills in the following certification areas:

- Agriculture 6–12
- Industrial Arts-Technology Education 6–12
- Marketing 6–12

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Fifth Edition.*

On August 12, 1999, the State Board of Education amended the rule to include revisions to the competencies and skills in the following areas:

- Professional Education
- Biology 6–12
- Computer Science K–12
- Educational Media Specialist PK–12
- Emotionally Handicapped K–12
- English 6–12
- Guidance and Counseling PK–12
- Mathematics 6–12
- Mentally Handicapped K–12
- Middle Grades English 5–9
- Middle Grades Math 5–9
- Music K–12
- Reading K–12
- Spanish K–12
- Specific Learning Disabilities K–12
- Varying Exceptionalities K–12

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Sixth Edition.*

On January 29, 2002, the State Board of Education amended the rule to include revisions to the competencies and skills in the following areas:

- Business Education 6–12
- English to Speakers of Other Languages K–12
- French K–12
- Health K–12
- Hearing Impaired K–12
- History 6–12
- Home Economics 6–12
- Middle Grades General Science 5–9
- Middle Grades Social Science 5–9
- Physical Education K–8
- Physical Education 6–12
- Social Science 6–12

Through the same rule amendment, the State Board of Education adopted competencies and skills in the following new examination areas:

- Exceptional Student Education K–12
- General Knowledge
- Kindergarten–Grade 6 (containing subtests in the following areas: Language Arts; Mathematics; Music, Visual Arts, Physical Education, and Health; Science and Technology; and Social Science)

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Seventh Edition.*

On February 18, 2003, the State Board of Education amended the rule to include revisions to the competencies and skills in Professional Education. Through the same rule amendment, the Florida Board of Education adopted competencies and skills in the following new examination areas:

- Middle Grades Integrated Curriculum 5–9
- Physical Education K–12

Additionally, the subject area Home Economics has been renamed Family and Consumer Science. The competencies and skills pertaining to Home Economics remained the same under Family and Consumer Science. This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Eighth Edition.*

On November 18, 2003, the State Board of Education amended the rule to include revisions to the competencies and skills in the following areas:

- Computer Science K–12
- Drama 6–12
- English 6–12
- Mathematics 6–12
- Music K–12
- Reading K–12
- Prekindergarten/Primary PK–3
- Social Science 6–12

This was printed as *Competencies and Skills Required for Teacher Certification in Florida, Ninth Edition*.

Examinations in the following subject areas were no longer administered after June 30, 2004:

- Elementary Education 1–6
- Emotionally Handicapped K–12
- Mentally Handicapped K–12
- Physically Impaired K–12
- Primary Education K–3
- Specific Learning Disabilities K–12
- Varying Exceptionalities K–12

On April 19, 2005, the State Board of Education amended the rule to include revisions to the competencies and skills in the following areas:

- Art K–12
- Biology 6–12
- Chemistry 6–12
- Earth-Space Science 6–12
- French K–12
- German K–12
- Health K–12
- Physics 6–12
- Preschool Education Birth–Age 4
- Spanish K–12

Examinations in the following subject areas were no longer administered after June 30, 2005:

- Economics 6–12
- Geography 6–12
- History 6–12
- Physical Education K–8
- Physical Education 6–12
- Political Science 6–12
- Psychology 6–12
- Sociology 6–12

The discontinued Physical Education tests were replaced by the **Physical Education K–12** test, which is required for certification in this subject area. Additionally, the subject area **Kindergarten–Grade 6** was renamed **Elementary Education K–6.** The competencies and skills pertaining to Kindergarten–Grade 6 remained the same under Elementary Education K–6. These changes were printed as *Competencies and Skills for Teacher Certification in Florida, Tenth Edition.*

On April 18, 2006, the State Board of Education amended the rule to include revisions to the competencies and skills in the following areas:

- Agriculture 6–12
- Elementary Education K–6
- English to Speakers of Other Languages K–12
- Middle Grades English 5–9
- Middle Grades General Science 5–9
- Middle Grades Mathematics 5–9
- Middle Grades Social Science 5–9
- Prekindergarten/Primary PK–3
- Professional Education
- Reading K–12
- Technology Education 6–12*
- School Psychologist PK–12
- Speech 6–12
- Speech Language Impaired K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Eleventh Edition.*

*The State Board of Education approved a name change for this test from **Industrial Arts-Technology Education** to **Technology Education 6–12** in spring 2006.

On April 17, 2007, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

- Computer Science K–12
- Educational Media Specialist PK–12
- Hearing Impaired K–12
- Humanities K–12
- Journalism 6–12
- Latin K–12
- Visually Impaired K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twelfth Edition.*

On June 17, 2008, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

English to Speakers of Other Languages K–12
Marketing 6–12
Reading K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Thirteenth Edition.*

On May 19, 2009, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Biology 6–12
Chemistry 6–12
Earth-Space Science 6–12
Educational Media Specialist PK–12
Elementary Education K–6
Exceptional Student Education K–12
Middle Grades General Science 5–9
Middle Grades Integrated Curriculum 5–9
Middle Grades Social Science 5–9
Physics 6–12
Prekindergarten/Primary PK–3
Social Science 6–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Fourteenth Edition.*

On May 18, 2010, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Guidance and Counseling PK–12
School Psychologist PK–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Fifteenth Edition.*

On May 17, 2011, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Health K–12
Physical Education K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Sixteenth Edition.*

On October 18, 2011, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

English for Speakers of Other Languages K–12
Mathematics 6–12
Middle Grades Mathematics 5–9
Professional Education

Additionally, the subject area English to Speakers of Other Languages K–12 has been renamed English for Speakers of Other Languages K–12. These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Seventeenth Edition.*

On July 17, 2012, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject area:

Prekindergarten/Primary PK–3

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Eighteenth Edition.*

As part of the State Board of Education's approval of the revisions to the Prekindergarten/Primary PK–3 competencies and skills, the State Board of Education also approved changes to the structure of the Prekindergarten/Primary PK–3 examination. The previous structure of one test consisting of 120 multiple-choice questions has become four subtests comprised of 60 multiple-choice items on each subtest.

On April 16, 2013, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

General Knowledge
Elementary Education K–6
English 6–12
Middle Grades English 5–9

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Nineteenth Edition.*

On September 17, 2013, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Computer Science K–12
Technology Education 6–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twentieth Edition.*

As part of the State Board of Education's approval of the revisions to the Elementary Education K–6 competencies and skills, the State Board of Education also approved changes to the structure of the Elementary Education K–6 examination. The previous structure of a composite test consisting of 225 multiple-choice questions has now become four subtests ranging from 50 to 60 multiple-choice items per subtest.

On November 18, 2014, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Business Education 6–12
Spanish K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-First Edition.*

The State Board of Education approved on September 20, 2011, the repeal of Rule 6A-4.0233, F.A.C., certification specialization requirements for the Middle Grades Integrated Curriculum (MGIC) subject area. The effective date of the rule repeal was October 25, 2011; the MGIC examination was discontinued after October 24, 2014.

On June 24, 2015, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Preschool Education (Birth–Age 4)
Reading K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-Second Edition.*

On June 22, 2016, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Exceptional Student Education (ESE) K–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-Third Edition.*

On January 18, 2017, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject area:

Art K–12

Additionally, the subject area **Technology Education 6–12** was renamed **Engineering and Technology Education 6–12**. These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-Fourth Edition.*

On March 19, 2019, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

Guidance and Counseling PK–12
Hearing Impaired K–12
Music K–12
School Psychologist PK–12
Speech-Language Impaired K–12
Visually Impaired K–12

Examinations in the following subject areas were no longer administered after December 31, 2017:

Journalism 6–12
Speech 6–12

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-Fifth Edition.*

On March 30, 2022, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

General Knowledge
Elementary Education K–6
English 6–12
English for Speakers of Other Languages K–12
Exceptional Student Education K–12
Middle Grades English 5–9
Prekindergarten/Primary PK–3
Reading K–12

Additionally, the subject area **Guidance and Counseling PK–12** was renamed **School Counseling PK–12**, and the subject area **Hearing Impaired K–12** was renamed **Deaf or Hard of Hearing PK–12**. These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-Sixth Edition.*

On October 19, 2022, the State Board of Education amended Rule 6A-4.0021, F.A.C., to include revisions to the competencies and skills in the following certification subject areas:

General Knowledge
Elementary Education K–6
Mathematics 6–12
Middle Grades Mathematics 5–9
Prekindergarten/Primary PK–3

These changes were printed as *Competencies and Skills Required for Teacher Certification in Florida, Twenty-Seventh Edition.*

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Subject Area/Section* **Page**

* Each subject area is assigned a section number (i.e., test code) for test administrations.

General Knowledge Test

Subtests in the Following Areas:

Essay
English Language Skills
Reading
Mathematics

Section 82

General Knowledge Test
Essay

1 Knowledge of formal college-level writing

- Select the appropriate mode of writing to use for a specific purpose, task or occasion, and audience.
- Demonstrate a variety of expository or argumentative techniques to convey information, including the use of an organizational structure appropriate to the subject.
- Provide a section that effectively introduces the topic.
- Formulate a relevant thesis or claim.
- Organize ideas and details logically.
- Use logical reasoning by providing relevant supporting evidence to argue a position and rebut counterclaims or to explain and analyze information.
- Use a variety of transitional words and techniques effectively throughout a written text.
- Demonstrate proficient use of college-level, standard written English (e.g., varied word choice, a variety of sentence patterns, language conventions, semantics).
- Provide a concluding statement or section that follows from, or supports, the argument or information presented.
- Maintain consistent point of view.
- Use appropriate voice and tone.

General Knowledge Test
English Language Skills

1 Knowledge of language structure

1. Determine correct placement of modifiers.
2. Apply knowledge of parallelism, including parallel expressions for parallel ideas.
3. Apply knowledge of a variety of effective sentence structures.
4. Determine patterns of organization in a written passage (i.e., text structures).

2 Knowledge of vocabulary application

1. Determine the meaning, including connotative meanings, of unfamiliar or multiple-meaning words and phrases in context.
2. Identify and apply correct word usage.
3. Determine appropriate diction and tone for addressing a given audience and purpose.

3 Knowledge of standard English conventions

1. Select standard verb forms.
2. Identify and correct inappropriate shifts in verb tense.
3. Select agreement between subject and verb.
4. Select agreement between pronoun and antecedent.
5. Identify and correct inappropriate pronoun shifts.
6. Select clear pronoun references.
7. Select pronoun case forms (e.g., subjective, objective, possessive).
8. Determine the correct use of adjectives and adverbs.
9. Select appropriate comparative and superlative degree forms.
10. Demonstrate command of standard spelling conventions.

11. Demonstrate command of standard punctuation (e.g., recognizing and correcting fragments, comma splices, run-on sentences, syntax errors).

12. Demonstrate command of standard capitalization.

General Knowledge Test
Reading

1 Knowledge of key ideas and details based on text selections

1. Identify textual evidence to support conclusions drawn from text.
2. Identify explicit meaning and details within text.
3. Determine and distinguish between inferences and conclusions based on textual evidence.
4. Determine and analyze the development of central ideas from one or more texts.
5. Summarize one or more texts using key supporting ideas and details.
6. Analyze how relationships between individuals, events, and ideas develop based on textual evidence.

2 Knowledge of text structure and meaning based on text selections

1. Interpret the meaning of words and phrases as used in text (e.g., figurative language, connotative language, academic vocabulary).
2. Analyze how specific word choices contribute to meaning or tone.
3. Analyze how authors use text structures and features to convey meaning.
4. Analyze how perspective and purpose influence the content and structure of texts.

3 Knowledge of the integration of information and ideas based on text selections

1. Evaluate the relationship of content presented in diverse formats.
2. Evaluate specific claims in texts based on relevancy, sufficiency, and validity of reasoning.
3. Synthesize information from a range of texts to develop a coherent explanation of a process, phenomenon, or concept.
4. Analyze and contrast the perspectives and approaches one or more authors use to explore similar topics or themes.

General Knowledge Test
Mathematics

1 Knowledge of number sense, concepts, and operations

1. Compare real numbers and identify their location on a number line.

2. Solve real-world problems, including problems in financial literacy (e.g., calculating percentages or simple interest), involving the four operations with rational numbers.

3. Evaluate expressions involving the order of operations.

2 Knowledge of geometry and measurement

1. Identify and classify simple 2D and 3D figures according to their mathematical properties.

2. Solve problems involving ratio and proportion (e.g., scaled drawings, models, real-world problems).

3. Determine an appropriate measurement unit and form (e.g., scientific notation) for real-world problems involving length, area, volume, or mass.

4. Solve real-world measurement problems, including fundamental units (e.g., length, mass, time), derived units (e.g., miles per hour, dollars per gallon), and unit conversions.

3 Knowledge of algebraic thinking and the coordinate plane

1. Determine whether two algebraic expressions are equivalent by applying properties of operations or equality.

2. Identify an algebraic expression, equation, or inequality that models a real-world situation.

3. Determine and solve equations or inequalities (i.e., linear and quadratic), algebraically or graphically, in mathematical or real-world problems.

4. Interpret key features of linear equations or graphs in real-world problems (e.g., explain slope and y-intercept, determine additional solutions).

5. Identify relations that satisfy the definition of a function.

6. Compare the slopes of two linear functions represented algebraically or graphically.

7. Apply linear, quadratic, and exponential functions to model and analyze real-world relationships.

4 Knowledge of probability, statistics, and data interpretation

1. Identify and interpret numerical and categorical data presented in various forms (e.g., histograms, circle graphs, scatterplots, two-way tables) to solve problems.

2. Analyze and evaluate how the presentation of data (e.g., scaling, chosen form) or selection of statistics (e.g., mean, median, mode) can lead to different or inappropriate interpretations in real-world contexts.

3. Calculate and interpret the meaning of measures of central tendency (i.e., mean, median, and mode) and variability (i.e., range and standard deviation) in real-world or abstract contexts from numerical and categorical data sets.

4. Solve and interpret real-world problems involving probability using counting procedures, tables, and tree diagrams.

Professional Education

Section 83

Professional Education

1 Knowledge of instructional design and planning

1. Choose appropriate methods, strategies, and evaluation instruments (e.g., formative assessment, summative assessment) for assessing and monitoring student performance levels, needs, and learning.

2. Select a variety of instructional practices, materials, and technologies that foster critical, creative, and reflective thinking aligned with state-adopted standards at the appropriate level of rigor.

3. Determine and apply learning experiences and activities that require students to demonstrate a variety of applicable skills and competencies.

4. Identify instructional resources based on measurable objectives, individual student learning needs, and performance levels.

5. Apply learning theories to instructional design and planning.

6. Determine long-term instructional goals and short-term objectives appropriate to student learning needs and performance levels aligned with state-adopted standards at the appropriate level of rigor.

7. Select and use culturally (i.e., regional, socio-economic, home language) responsive instructional materials and practices in planning.

8. Select lessons and concepts that are sequenced to activate prior knowledge and ensure coherence among the lessons.

9. Identify patterns of physical, social, and academic development to differentiate instructional design for student mastery.

10. Determine and apply appropriate intervention strategies based on individual student needs and data.

2 Knowledge of appropriate student-centered learning environments

1. Select and use appropriate techniques for organizing, allocating, and managing the resources of time, space, and attention in a variety of learning environments (e.g., face-to-face, virtual).

2. Apply appropriate strategies and procedures to manage individual student behaviors and group dynamics.

3. Use effective techniques for communicating high expectations to all students.

4. Evaluate and adapt the learning environment to accommodate the needs and backgrounds (i.e., cultural, home language, family) of all students.

5. Apply relevant techniques for modeling appropriate oral and written communication skills.

6. Determine skills and practices that encourage innovation and foster a safe climate of openness, inquiry, equity, and support for all students.

7. Apply information and communication technologies to maintain a student-centered learning environment.

8. Identify assistive technologies that enable all students to effectively communicate and achieve their educational goals.

3 Knowledge of instructional delivery and facilitation through a comprehensive understanding of subject matter

1. Use motivational strategies to engage and challenge all students.

2. Apply appropriate instructional practices for developing content area literacy.

3. Analyze gaps in students' subject matter knowledge in order to improve instructional delivery.

4. Assess and adapt instruction to address preconceptions and misconceptions of subject matter.

5. Relate subject matter to life experiences and across disciplines.

6. Apply techniques for developing higher-order critical thinking skills.

7. Select varied strategies, resources, and appropriate technology for relevant and comprehensible instruction.

8. Identify differentiated instructional practices based on assessment of learning needs, individual differences, and continuous student feedback.

9. Determine and apply techniques to provide feedback in order to promote student achievement.

10. Apply appropriate subject area activities to accommodate learning needs, developmental levels, and experiential backgrounds of all students.

4 Knowledge of various types of assessment strategies for determining impact on student learning

1. Analyze assessment data from multiple sources to guide instructional decisions.

2. Select formative and summative assessments that match learning objectives leading to student mastery.

3. Use a variety of assessment tools to monitor student progress, achievement, and learning gains.

4. Determine appropriate assessments and testing conditions to accommodate learning styles and varying knowledge levels of students.

5. Identify ways to share the importance and outcomes of student assessment data with students and stakeholders.

6. Use technology to organize and integrate assessment data.

5 Knowledge of relevant continuous professional improvement

1. Determine relevant and measureable professional development goals to strengthen the effectiveness of instruction based on educator and students' needs.

2. Analyze and apply data-informed research to improve instruction and student achievement.

3. Use a variety of data, independently and in collaboration with colleagues, to evaluate learning outcomes, adjust planning, and continuously improve and reflect upon the effectiveness of lessons and practices.

4. Identify ways to collaborate with home, school, and other stakeholders to foster communication and obtain resources in order to support diverse student learning and continuous improvement.

5. Select and determine appropriate professional growth opportunities and reflective practices to improve teacher performance and impact student learning.

6. Analyze the implementation of professional development experiences and application to the teaching and learning process.

7. Choose appropriate professional growth opportunities in technology for the design and delivery of instruction to impact student learning.

6 Knowledge of the Code of Ethics and Principles of Professional Conduct of the Education Profession in Florida

1. Apply the Code of Ethics and Principles of Professional Conduct to professional and personal situations.

2. Identify statutory grounds and procedures for disciplinary action, the penalties that can be imposed by the Educational Practices Commission against a certificate holder, and the appeals process available to the individual.

3. Apply knowledge of rights, legal responsibilities, and procedures for reporting incidences of abuse, neglect, or other signs of distress.

4. Identify and apply policies and procedures for the safe, appropriate, and ethical use of technologies.

5. Determine and apply the appropriate use and maintenance of students' information and records.

7 Knowledge of research-based practices appropriate for teaching English Language Learners (ELLs)

1. Relate the nature and role of culture, cultural groups, and individual cultural identities into learning experiences for all students.

2. Analyze student developmental characteristics in relation to first and second language literacy acquisition stages to design instruction for students.

3. Interpret the Consent Decree to integrate teaching approaches, methods, strategies, and communication with stakeholders in order to improve learning for ELLs.

4. Evaluate and differentiate standards-based curriculum, materials, resources, and technology for ELLs based on multicultural, multi-level learning environments.

5. Analyze assessment issues as they affect ELLs and determine appropriate accommodations according to ELLs' varying English proficiency levels and academic levels.

8 Knowledge of effective literacy strategies that can be applied across the curriculum to impact student learning

1. Apply effective instructional practices to develop text reading skills in the appropriate content area.

2. Select instructional practices for developing and using content area vocabulary.

3. Determine instructional practices to facilitate students' reading comprehension through content areas.

4. Apply appropriate literacy strategies for developing higher-order critical thinking skills.

5. Select appropriate resources for the subject matter and students' literacy levels.

6. Differentiate instructional practices based on literacy data for all students.

Agriculture
6–12

Section 54

Agriculture 6–12

1 Knowledge of leadership, career opportunities, and employability skills

1. Identify the National FFA organization mission, program of activities, career development events, awards, and degree programs.
2. Identify important events in the history of the FFA.
3. Identify the organizational structure of the FFA.
4. Identify responsibilities of FFA chapter officers and committee chairpersons.
5. Identify public speaking skills.
6. Identify the rules of parliamentary procedure.
7. Identify career opportunities in agriculture.
8. Identify skills for obtaining and maintaining employment.

2 Knowledge of animal science

1. Identify livestock and companion animal terminology.
2. Identify desirable characteristics of livestock and companion animals.
3. Identify animal production systems and reproduction practices.
4. Identify animal nutrition, feedstuffs, and feeding practices.
5. Identify components of animal health, including diseases, health and sanitation practices, and veterinary terminology.
6. Identify safety practices related to animal handling.
7. Identify principles and methods of marketing animals and animal products.
8. Identify appropriate procedures for animal exhibition.
9. Identify animal anatomy and physiology.
10. Identify practices in aquatic animal production.
11. Identify practices that promote animal welfare.

3 Knowledge of soil science

1. Evaluate the suitability of different types of soil for the production of various crops.
2. Identify soil formations and the classifications of soil.
3. Identify methods and procedures for soil testing.
4. Identify formulations and use of different types of fertilizer.
5. Identify methods and techniques of soil preparation, water management, and rotation in the production of crops.
6. Identify types of soil erosion and conservation practices.

4 Knowledge of plant science

1. Apply basic principles of taxonomy to plant classification.
2. Identify distinguishing features of major plant groups.
3. Identify requirements for plant growth and development.
4. Identify parts of plants and their functions.
5. Identify the physiological processes in plants.
6. Identify the effects of different environmental factors on plant growth and development.
7. Identify sexual and asexual plant reproduction processes.
8. Identify basic principles of plant genetics and their application to agriculture.
9. Identify types, varieties, characteristics, and uses of economically important crops and ornamentals grown in Florida.
10. Identify procedures and techniques for selecting, planting, caring for, harvesting, and handling food crops.
11. Identify the effects of pests and nutrient deficiencies on crops, turf, and ornamentals.
12. Identify proper procedures and practices for greenhouse management.
13. Identify procedures and techniques for preparing and using different types of plant media.
14. Identify procedures and techniques for selecting and caring for ornamental crops.
15. Identify basic principles and techniques of landscape design and construction.
16. Identify proper handling and application of chemicals.

5 Knowledge of agricultural systems technology

1. Identify safety practices used in an agriculture laboratory.
2. Identify common hand and power tools and their proper uses.
3. Identify the proper use of oxyacetylene welding, cutting, and metal fabrication equipment.
4. Use measurement and mathematics in agriculture applications.
5. Identify basic agricultural equipment safety practices.
6. Identify procedures for maintaining tools and equipment.
7. Identify basic principles of gas and diesel engine operation.
8. Identify facility construction and building maintenance practices.
9. Identify principles of electric controls, motors, and electricity.
10. Identify principles in managing plumbing and irrigation systems.
11. Apply principles of physics to agricultural systems.
12. Identify uses of computer technology in agriculture.

6 Knowledge of environmental sciences and natural resources

1. Identify conservation practices related to renewable and nonrenewable resources.
2. Identify the hydrologic cycle in Florida.
3. Identify governmental agencies that regulate environmental and natural resources.
4. Identify the relationships within Florida ecosystems.
5. Identify positive and negative impacts of agriculture on the environment.

7 Knowledge of agricultural business management, economics, and marketing

1. Identify the role and importance of the agribusiness sector in economic development.
2. Identify the input, production, and marketing sectors of the agribusiness system.
3. Identify methods of planning and organizing agribusiness enterprises.
4. Use record keeping, budgeting, and financial statements in making budgetary decisions.

5. Identify sources and uses of credit in agriculture.

6. Identify the principles of supply and demand and the economics of resource use for agricultural commodities.

7. Identify practices used in agricultural marketing and international trade.

8. Identify the roles of government agencies that serve agriculture.

9. Identify the types of supervised agriculture experience (SAE) programs and their benefits.

8 Knowledge of agricultural department management and professional development

1. Identify professional publications and organizations for agricultural education.

2. Identify strategies in agricultural curriculum planning, curriculum development, and evaluation of instructional resource materials.

3. Identify the functions of agricultural education advisory committees, alumni, and community support groups.

4. Identify important legislation affecting the development of agricultural education.

5. Identify the roles of FFA, SAE, and classroom instruction in an agriculture program.

6. Identify principles of agricultural classroom and laboratory management.

9 Knowledge of biotechnology

1. Identify historical milestones, advantages, and disadvantages in biotechnology.

2. Identify the parts of a cell structure and their functions.

3. Predict the characteristics and performance of offspring based upon the genetic makeup of the parents.

10 Knowledge of food science and systems

1. Identify major food commodities.

2. Identify food safety issues on local, state, national, and international levels.

3. Identify beneficial microorganisms involved in the food industry.

4. Identify appropriate food-handling procedures.

5. Identify emerging techniques in food processing and preservation.

6. Identify important historical events and developments in food production.

7. Identify differences in agricultural practices employed in various regions of the world.

Art
K–12

Section 01

Art K–12

1 Knowledge of the processes of two-dimensional art

1. Identify and demonstrate knowledge of materials, tools, processes, and visual characteristics of two-dimensional art (e.g., drawing, painting, printmaking).

2. Demonstrate understanding of the elements of art, principles of design, and the selection of media for visual effect.

3. Apply knowledge of hazardous substances, safety procedures, and proper use and care of equipment.

2 Knowledge of the processes of three-dimensional art

1. Identify and demonstrate knowledge of materials, tools, processes, and visual characteristics of three-dimensional art (e.g., sculpture, ceramics, mixed media, fibers).

2. Demonstrate understanding of the elements of art, principles of design, and the selection of media for visual effect.

4. Apply knowledge of hazardous substances, safety procedures, and proper use and care of equipment.

3 Knowledge of the processes of digital arts

1. Identify and demonstrate knowledge of materials, equipment, tools, processes, and visual characteristics of digital arts (e.g., graphic design, photography, computer technology).

2. Demonstrate understanding of the elements of art, principles of design, and the selection of media for visual effect.

3. Apply knowledge of safety procedures and proper use and care of equipment.

4 Knowledge of art history and culture

1. Identify major artists and their works.

2. Analyze art styles, genres, movements, and periods.

3. Demonstrate knowledge of social, cultural, environmental, and historical influences.

4. Analyze and compare the role of art in cultures throughout the world.

5 Knowledge of art criticism processes

1. Identify sources of inspiration to create art.
2. Analyze the elements of art and principles of design to critique art.
3. Apply the critical process of describing, analyzing, interpreting, and evaluating art.
4. Apply aesthetic theories to the interpretation of art.

6 Knowledge of art education and pedagogy

1. Analyze the social, historical, and philosophical foundations of art education.
2. Apply theories of child development to curriculum and instruction.
3. Apply equity, fairness, and diversity to the learning environment.
4. Apply effective delivery and facilitation techniques of art instruction.
5. Apply ethical standards regarding copyright, plagiarism, and appropriation.
6. Apply appropriate methods of assessment and evaluation.

7 Knowledge of present-day connections and applications of art.

1. Analyze connections between art and other disciplines.
2. Analyze career opportunities in art.
3. Identify and analyze real-world applications of art.

Biology
6–12

Section 02

Biology 6–12

1 Knowledge of the investigative processes of science

1. Identify components, proper use, and care of light microscopes.

2. Distinguish between the types of microscopy (e.g., scanning electron microscopy, transmission electron microscopy, phase contrast) and their applications.

3. Identify proper techniques for common laboratory procedures (e.g., dissecting; preserving, staining, and mounting microscope specimens; preparing laboratory solutions; using chromatography; performing gel electrophoresis).

4. Identify proper techniques for field studies (e.g., site selection, sampling, transects, collecting techniques, environmental measurements).

5. Select appropriate uses of common laboratory procedures (e.g., polymerase chain reaction, chromatography, spectrophotometry, centrifugation, gel electrophoresis).

6. Calculate measurements in the appropriate metric units.

7. Differentiate between assumptions, inferences, observations, hypotheses, conclusions, theories, and laws.

8. Interpret empirical data (e.g., charts, graphs, tables, diagrams).

9. Differentiate the characteristics and methodologies of scientific and nonscientific knowledge.

10. Identify relationships between the variables and possible outcomes of a specific experiment.

11. Relate the validity and reliability of scientific knowledge to reproducibility, statistical significance, technological limitations, bias, and types of error.

12. Identify the development of biological theories and knowledge through important historical events, creative endeavors of diverse individuals, and experimental evidence.

13. Differentiate between qualitative and quantitative data in experimental, observational, and modeling methods of research.

14. Determine the elements of a well-designed and controlled experiment.

15. Identify evidence of the dynamic nature of science in the face of new scientific information.

16. Identify patterns (e.g., circadian rhythms, migration, succession, cycles) at the level of organisms, populations, or ecosystems that govern the occurrence of natural events.

2 Knowledge of the interactions between science, technology, and society

1. Analyze the ethical, legal, economic, and social implications of current scientific research and practices (e.g., reproductive and life-sustaining technologies, genetic basis for behavior, population growth and control, government and business influences on biotechnology, cloning, genomics, genetic engineering).

2. Analyze environmental challenges (e.g., ozone depletion, pollution, climate change, health effects) that may result from scientific and technological advances.

3. Analyze the effects (e.g., multidrug resistance, rapid transmission across international boundaries) of globalization on the spread and treatment of pathogens and invasive species.

4. Identify pertinent legislation and national guidelines (e.g., National Association of Biology Teachers, International Society of Environmental Forensics, Occupational Safety and Health Administration chemical safety guidelines, material safety data sheets) regarding laboratory safety, hazardous materials, experimentation, and the use and handling of organisms in the classroom.

3 Knowledge of the chemical processes of living things

1. Identify the structures, functions, and importance of inorganic and organic compounds (e.g., water, mineral salts, carbohydrates, lipids, proteins, nucleic acids) in cells.

2. Apply the laws of thermodynamics to living systems, including the role of enzymes in biological reactions.

3. Predict the effects of changes in pH, temperature, substrate concentration, and enzyme concentration on reaction rate.

4. Identify substrates, products, and relationships in aerobic respiration (e.g., glycolysis, the Krebs cycle, electron transport), including metabolism of carbohydrates, fats, and amino acids, and in anaerobic respiration (e.g., alcoholic fermentation, lactic acid fermentation).

5. Compare end products and energy yields of anaerobic and aerobic respiration.

6. Identify the raw materials and products of C_3 photosynthesis, as well as factors that affect the rate of light-dependent reactions and the Calvin cycle.

7. Identify key differences between C_3, C_4, and CAM photosynthesis, and the evolutionary and ecological significance of these pathways.

8. Analyze the role of chemiosmosis in photosynthesis and respiration.

9. Compare heterotrophy and autotrophy and the roles of these processes in the environment.

10. Evaluate the components and roles of the antigen-antibody reaction.

11. Compare active and passive immunity.

12. Evaluate the roles of cell recognition (e.g., cell-to-cell signaling, autoimmune diseases, tissue rejection, cancer, pollen or stigma-style interaction) in normal and abnormal cell activity.

13. Identify the effect of environmental factors on the biochemistry of living things (e.g., ultraviolet light effects on melanin and vitamin D production).

14. Identify the roles of ATP and ADP in cellular processes.

15. Compare chemosynthetic and photosynthetic processes and the roles of organisms using these processes in the ecosystem.

16. Identify cell-to-cell communication (e.g., electrical, chemical) in living things.

17. Identify specific and nonspecific immune responses to vaccines and inoculations.

4 Knowledge of the interactions between cell structure and cell function

1. Identify the major scientists and events that contributed to the development of the cell theory.

2. Distinguish between the major structural characteristics of prokaryotic and eukaryotic cells.

3. Relate the structure of cell organelles to their functions.

4. Differentiate the events of each phase of the cell cycle (e.g., G_1, S, G_2, M) and the regulatory mechanisms of the cycle.

5. Compare the mechanisms and results of nuclear division (i.e., karyokinesis) and cell division (i.e., cytokinesis) in plant and animal cells.

6. Compare characteristics of the major taxa (e.g., domains, kingdoms, phyla), including cellular characteristics.

7. Evaluate the relationships between the structures and functions of cell membrane components.

8. Compare active and passive cellular transport mechanisms.

5 Knowledge of genetic principles, processes, and applications

1. Evaluate the relationships between structure and function in nucleic acids.

2. Sequence the principal events of DNA replication.

3. Sequence the principal events of protein synthesis.

4. Distinguish between the functions of DNA and RNA.

5. Distinguish between the regulatory systems for prokaryotic and eukaryotic protein synthesis.

6. Identify proper techniques for recombinant DNA technology (e.g., Southern blotting, creation of transgenic organisms, gene splicing, mitochondrial DNA isolation).

7. Evaluate possible effects of environmental and genetic influences (e.g., viruses, oncogenes, carcinogenic agents, mutagenic agents, epigenetic factors) on gene structure and expression.

8. Analyze the processes and products of meiosis in plants, animals, and fungi.

9. Identify Mendelian laws of inheritance, their relationship to chromosomes, and related terminology.

10. Analyze applications of probability and statistical analysis (e.g., chi-square, Punnett square) in genetics.

11. Analyze various patterns of inheritance (e.g., sex-linked, sex-influenced, sex-limited, incomplete dominance, codominance, autosomal linkage, multiple alleles, polygenic inheritance).

12. Identify the causes of genetic disorders (e.g., point mutation, nondisjunction, aneuploidy, translocation, deletion, insertion, inversion, duplication).

13. Identify the effect of a mutation in a DNA sequence on the products of protein synthesis.

6 Knowledge of the structural and functional diversity of viruses and prokaryotic organisms

1. Distinguish the structure and function of viruses and prokaryotic organisms.

2. Identify the effects of viruses (e.g., AIDS, influenza, measles, feline leukemia, some human cancers) and prokaryotes (e.g., tuberculosis, bubonic plague, cholera) on organisms.

3. Relate the structures and functions (e.g., morphology, motility, reproduction and growth, metabolic diversity) of prokaryotes to their behavior and identification.

4. Differentiate the major types of bacterial genetic recombination (i.e., transduction, transformation, conjugation).

5. Relate microbial processes and products to their uses in biotechnology.

7 Knowledge of the structural and functional diversity of protists, fungi, and plants

1. Identify major types of protists, fungi, and plants.

2. Identify the positive and negative effects of protists, fungi, and plants on other living things.

3. Relate the structures of specialized plant tissues to their functions.

4. Relate the characteristics of vascular and nonvascular plants to adaptations allowing these organisms to broaden their ecological niches.

5. Identify the functions of the major organs of angiosperms and gymnosperms and the survival advantages associated with those organs.

6. Compare the structures of monocots and dicots (e.g., seeds, vascular bundles, venation, flower parts).

7. Relate the major mechanisms (e.g., transport, storage, water conservation, reproduction, transpiration) in plants to environmental stimuli.

8. Analyze the role of major plant growth regulators (e.g., auxins, gibberellins, ethylene).

9. Identify methods of reproduction in plants.

10. Analyze patterns of alternation of generations in plants, fungi, and algae.

8 Knowledge of the structural and functional diversity of animals

1. Relate the structures of animal tissue types (e.g., epithelial, connective, muscle, nervous) to their functions.

2. Characterize major animal body plans (e.g., symmetry, coelomic character, embryonic origin).

3. Identify the stages, sequence, and processes of differentiation in embryological development for representative animal phyla.

4. Relate the structures of circulatory and lymphatic systems to their functions.

5. Relate the structures of excretory and digestive systems to their functions.

6. Relate the structures of endocrine and nervous systems to their functions.

7. Relate the structures of integumentary and musculoskeletal systems to their functions.

8. Relate the structures of reproductive systems to their functions.

9. Relate the structures of respiratory systems to their functions.

10. Analyze how body systems contribute to the human immune response.

11. Analyze the interconnectedness of animal organ systems.

12. Analyze the effects of positive and negative feedback loops in human systems (e.g., vertebrate hormones, fight or flight).

13. Identify aspects of animal social behavior (e.g., communication and signals, dominance hierarchy, territoriality, aggression, courtship, innate and learned behavior).

9 Knowledge of ecological principles and processes

1. Distinguish between individuals, populations, communities, ecosystems, biomes, and the biosphere.

2. Analyze the relationship between organisms (e.g., producers, consumers, decomposers) and their trophic levels.

3. Identify processes, components, and roles of organisms in the hydrologic, carbon, nitrogen, and phosphorous cycles.

4. Analyze patterns of energy flow in an ecosystem.

5. Evaluate factors that affect population composition, growth, size, and geographic distribution.

6. Classify examples of species interactions (e.g., competition, predation, parasitism, mutualism, commensalism).

7. Distinguish between primary and secondary succession in biotic communities.

8. Analyze the costs and benefits of managing renewable and nonrenewable resources.

9. Evaluate the effects of human population size, resource use, and technology on environmental quality.

10. Evaluate the consequences of loss of biodiversity.

11. Characterize the biotic and abiotic components that define Florida's ecosystems (e.g., freshwater, marine, estuary, terrestrial).

10 Knowledge of evolutionary mechanisms

1. Compare the current theory of evolution by natural selection with previous scientific theories of evolution (e.g., Lamarck, Darwin).

2. Analyze exceptions to and limitations of the biological species concept.

3. Compare systems of classification (e.g., classical taxonomy, phenetics, cladistics).

4. Apply a taxonomic (e.g., dichotomous) key to a set of objects.

5. Analyze variation within a species along an environmental cline.

6. Identify factors affecting speciation (e.g., mutation, recombination, types of isolation, sexual reproduction and selection, genetic drift, plate tectonics, geographic distribution).

7. Evaluate the roles of mutation, recombination, isolation, sexual reproduction and selection, genetic drift, plate tectonics, and geographic distribution in evolution.

8. Compare the concepts of punctuated equilibrium and gradualism.

9. Interpret examples of evidence for evolutionary theory (e.g., molecular, morphological, embryological, paleontological).

10. Analyze aspects of modern scientific theories (e.g., primitive precell, endosymbiotic) on the origin and early evolution of life on Earth.

11. Differentiate patterns of evolutionary change (e.g., coevolution, convergent evolution, divergent evolution, parallel evolution) as they relate to major taxa.

12. Apply the Hardy-Weinberg equilibrium, using the formula and assumptions, to predict changes in genotypic frequencies in a population.

13. Identify basic trends in hominid evolution from early ancestors to modern humans.

Business Education
6–12

Section 51

Business Education 6–12

1 Knowledge of information technology

1. Identify touch keyboarding techniques.
2. Apply functions and common features of word processing, spreadsheet, database, digital publishing, presentation, multimedia, and communication software appropriate for specific tasks.
3. Differentiate between the characteristics of networks used in business applications.
4. Apply diagnostic and troubleshooting techniques to hardware and software problems.
5. Identify current entry-level computer coding practices.
6. Identify characteristics and uses of emerging technologies and devices.

2 Knowledge of business communications

1. Apply the rules for standard grammar and punctuation usage.
2. Demonstrate communication skills in written, verbal, and nonverbal forms.
3. Apply effective internal and external communication skills.
4. Apply standard formats for business documents.

3 Knowledge of accounting and personal finance

1. Identify and apply manual and computerized accounting concepts, principles, and procedures.
2. Interpret and use financial data and statements.
3. Apply personal money management and consumer credit strategies to make informed decisions.
4. Evaluate services and products provided by financial institutions.

4 Knowledge of business management and administrative procedures

1. Identify and apply management theories, styles, functions, and procedures.
2. Analyze business organizational structures and management responsibilities.

3. Apply human resource management principles (e.g., employee benefits, advancement, conflict resolution).

4. Apply administrative office procedures (e.g., records management, file management).

5. Analyze procedures for implementing information technology security, privacy, and risk management policies.

6. Identify characteristics of professional business behavior and effective customer service strategies.

5 Knowledge of entrepreneurship and marketing

1. Differentiate among the types of business ownership.

2. Identify the characteristics of entrepreneurship.

3. Analyze strategies for starting and maintaining a profitable business.

4. Apply principles of the marketing mix (i.e., price, place, promotion, and product) and distinguish among various marketing strategies.

6 Knowledge of business law and ethics

1. Interpret common legal processes, procedures, and documents associated with business and technology.

2. Identify the major types of laws (e.g., intellectual property, employment, computer, criminal, property, international) and their characteristics.

3. Differentiate among the jurisdiction of federal, state, district, and local courts and laws.

4. Analyze the impact of U.S. government regulations on business operations.

5. Analyze the relationships between contract law, law of sales, and consumer law.

6. Assess ethical practices as they relate to business.

7 Knowledge of foundations, teaching methods, and professional development

1. Identify professional and student publications, organizations, and current trends affecting business education.

2. Apply strategies for curriculum planning and development for diverse learners.

3. Apply strategies for developing and cultivating stakeholder partnerships.

4. Apply instructional strategies to assist all students in developing employability skills.

5. Apply effective lesson presentation and assessment techniques for diverse student populations using a variety of learning platforms.

6. Evaluate tools and instructional resource materials such as hardware, software, textbooks, and digital content for diverse learners.

8 Knowledge of international business

1. Apply appropriate communication strategies for effective international business relations.

2. Analyze the impact of international business on domestic and foreign economies.

3. Analyze social, cultural, and ethical factors that affect and influence the global business environment.

4. Analyze political, legal, and economic factors that affect and influence the global business environment.

5. Analyze financial and marketing decisions that affect and influence the global business environment.

9 Knowledge of career development

1. Evaluate tools, resources, and strategies that facilitate the transition from school to college and careers.

2. Identify emerging workplace trends, career paths, and related issues.

3. Analyze characteristics of workplace expectations and soft skills as they relate to career development.

Chemistry
6–12

Section 03

Chemistry 6–12

1 Knowledge of the nature of matter

1. Differentiate between pure substances, homogeneous mixtures, and heterogeneous mixtures.
2. Determine the effects of changes in temperature, volume, pressure, or quantity on an ideal gas.
3. Apply units of mass, volume, and moles to determine concentrations and dilutions of solutions.
4. Analyze the effects of physical variables (e.g., pressure, temperature) on solubility and the dissolving process.
5. Analyze problems relating colligative properties to molar mass and solution concentrations.
6. Analyze the effects of forces between chemical species on physical properties (e.g., melting point, boiling point, vapor pressure, solubility, conductivity) of matter.
7. Solve problems involving an intensive property (e.g., density, specific heat) of matter.
8. Differentiate between various physical methods (e.g., chromatography, distillation, filtration) for separating the components of mixtures.
9. Identify the unique physical and chemical properties of water.
10. Differentiate between physical and chemical properties and physical and chemical changes of matter.

2 Knowledge of energy and its interaction with matter

1. Distinguish between different forms of energy (e.g., thermal, electrical, nuclear).
2. Relate temperature and heat to the motion of particles (e.g., atoms, molecules) using the kinetic molecular theory.
3. Interpret a phase diagram of a pure substance.
4. Interpret a heating and cooling curve of a substance.
5. Calculate thermal changes associated with chemical reactions, such as heats of reaction, heats of formation, and heats of combustion, from thermochemical data.
6. Analyze entropy changes during solution formation, phase changes, and chemical reactions.
7. Predict spontaneity of a chemical process given either initial and final values of Gibbs free energy or temperature, enthalpy, and entropy.

8. Relate regions of the electromagnetic spectrum to the energy, wavelength, and frequency of photons.

9. Identify the effects of various types of electromagnetic radiation (e.g., ultraviolet, infrared) on the chemical or physical properties of matter.

10. Recognize that energy can be transformed from one form to others and that the total energy in a closed system is conserved.

11. Distinguish between the characteristics of endothermic and exothermic reactions.

3 Knowledge of bonding and molecular structure

1. Identify the basic theory and applications of spectroscopy (e.g., infrared, mass spectrometry, nuclear magnetic resonance, ultraviolet, x-ray).

2. Identify types or examples of bonds (e.g., metallic, ionic, polar covalent, nonpolar covalent).

3. Relate electronegativity differences to bond type.

4. Identify properties of simple organic compounds.

5. Given the structural formula for a simple covalent compound, identify the hybridization of the atoms.

6. Identify sigma and pi bonds in a molecule.

7. Interpret the information derived from the following models: Lewis electron dot structures, valence shell electron pair repulsion (VSEPR) theory, and molecular orbital (M/O) theory involving diatomic molecules.

8. Select the most probable Lewis electron dot structure for an ionic or covalent formula (e.g., CO_2, Na_2CO_3) that follows the octet rule.

9. Predict the geometry (e.g., bent, linear, tetrahedral, trigonal bipyramidal) of simple molecules.

10. Predict the polarity of simple molecules.

11. Predict physical or chemical properties based on the type of bonding involved.

12. Identify the formula for an inorganic chemical compound (e.g., ionic, molecular, acid), given its name.

13. Identify the name of an inorganic chemical compound (e.g., ionic, molecular, acid), given its formula.

14. Identify proper names and formulas for simple organic compounds containing one functional group.

15. Identify common functional groups in an organic molecule.

16. Differentiate between the chemical structures of common biochemical compounds (e.g., lipids, amino acids, peptides, sugars, carbohydrates, nucleic acids).

4 Knowledge of chemical reactions and stoichiometry

1. Balance chemical equations.

2. Given common chemical reactants and reaction conditions, predict probable products.

3. Solve mass-mass stoichiometry problems.

4. Solve mass-gas volume stoichiometry problems.

5. Solve solution stoichiometry problems.

6. Solve stoichiometry problems with limiting reactants.

7. Determine empirical and molecular formulas from experimental data.

8. Analyze the effects of concentration, temperature, pressure, surface area, and the presence or absence of catalysts on reaction rate.

9. Predict the effect of a change in concentration, temperature, or pressure on the state of a system initially at equilibrium by applying Le Châtelier's principle.

10. Determine rate laws from concentrations, rate data, or graphs.

11. Determine either the equilibrium constant, *K*, or the concentration of a reaction species at equilibrium.

12. Identify the characteristics of a chemical system in dynamic equilibrium.

13. Identify major characteristics of strong and weak acids or bases.

14. Evaluate the characteristics of buffer systems.

15. Interpret graphical and numerical titration data.

16. Identify oxidation-reduction processes.

17. Balance redox equations in acidic or basic solutions.

18. Determine the spontaneity of a chemical reaction using standard reduction potentials.

19. Identify the characteristics of combustion reactions of simple organic compounds (e.g., sugars, alcohols, simple fossil fuels).

20. Solve problems related to pH or pOH of strong acids or bases.

21. Analyze electrolytic and voltaic cells.

22. Given a balanced chemical equation, identify the common reaction type.

5 Knowledge of atomic theory and structure

1. Using the periodic table, determine the number of protons, neutrons, and electrons in an atom or ion of a specific isotope.

2. Using the periodic table, analyze periodic trends in physical properties (e.g., ionic size, atomic size, boiling point, melting point) of the representative elements.

3. Using the periodic table, analyze periodic trends in chemical properties (e.g., electron affinity, ionization energy, electronegativity) of the representative elements.

4. Using the periodic table, determine electron configurations and orbital filling diagrams for elements with atomic numbers 1–56 and their ions.

5. Relate an element's chemical reactivity to its valence-shell electron configuration.

6. Identify the major characteristics of waves and particles, as well as the dual nature of matter.

7. Identify characteristics of unstable nuclei, including the particles and electromagnetic radiation they emit.

8. Given measurable quantities, solve problems involving radioactive decay.

9. Balance simple nuclear equations.

10. Identify the main characteristics of nuclear fission and fusion.

11. Identify electron density distribution diagrams and characteristics for *s*, *p*, and *d* orbitals (e.g., nodes, shapes).

12. Predict the effects of energy quantization at the atomic level.

6 Knowledge of the nature of science

1. Identify the characteristics and components of scientific inquiry and how it differs from other areas of learning.

2. Analyze the characteristics (e.g., independent, dependent, and controlled variables; bias; control groups) of a given experimental design.

3. Interpret empirical and graphical data to draw valid conclusions.

4. Analyze the relationship of experimental observations to experimental design, including underlying assumptions, hypotheses, conclusions, models, or theories.

5. Differentiate between the uses of qualitative and quantitative data.

6. Identify how the progressive development of basic science affects applied science, technology, the economy, and society.

7. Identify evidence of the progressive historical development of science.

7 Knowledge of measurement

1. Convert between units for one-, two-, and three-dimensional quantities.

2. Determine the units of a given mathematical expression.

3. Apply prefixes (e.g., kilo-, milli-, nano-) used in scientific measurements.

4. Distinguish between accuracy and precision and between systematic and random error.

5. Apply the correct number of significant figures in measurements or calculations.

6. Relate the Celsius, Fahrenheit, and Kelvin temperature scales, including the boiling point and melting point of water.

7. Use scientific notation (e.g., convert between decimal and scientific notation, perform mathematical calculations with numbers written in scientific notation).

8. Solve a multistep problem involving dimensional analysis (e.g., kinetics, solution preparation, thermochemistry).

8 Knowledge of appropriate laboratory use and procedures

1. Identify appropriate chemistry laboratory procedures for the safe storage, use, and disposal of materials and equipment.

2. Choose the correct laboratory equipment for a particular procedure.

3. Identify emergency procedures and safety equipment needed in the chemistry laboratory and classroom.

4. Identify the areas of teacher liability and responsibility in chemistry-related activities.

5. Relate knowledge of pertinent guidelines (e.g., from American Chemical Society, Environmental Protection Agency, material safety data sheets, National Science Teachers Association, Americans with Disabilities Act) to laboratory safety, hazardous materials, experimentation, and accommodations for students with special needs.

Computer Science
K–12

Section 05

Computer Science K–12

1 Knowledge of computational thinking and problem solving

1. Analyze a problem and apply appropriate solution strategies.
2. Apply the steps of algorithmic problem solving when designing solutions to problems.
3. Apply the stages of the software development life cycle (i.e., problem definition, analysis, design, testing, implementation, maintenance).
4. Determine and select an appropriate algorithm for a given problem.
5. Predict outputs of algorithms for a given input.
6. Identify an appropriate set of data necessary for testing a computer solution.

2 Knowledge of data types and structures

1. Distinguish between constants and variables and between local and global identifiers.
2. Distinguish between integer, real number, character, string, Boolean, and object data types.
3. Recognize and convert between binary, decimal, and hexadecimal number systems.
4. Identify characteristics and uses of data structures, including arrays, linked lists, stacks, queues, and sets.
5. Distinguish between instance, class, and local variables in an object-oriented design.
6. Identify components of class declarations for an object-oriented program and distinguish between public and private access specifiers.

3 Knowledge of programming logic

1. Distinguish between error types (e.g., syntax, runtime, logic) and apply principles of debugging.
2. Identify principles, characteristics, and uses of internal and external program documentation.
3. Analyze the characteristics and functions of object-oriented and procedural languages.
4. Select the appropriate algorithmic sequence, conditional, iteration, and recursive constructs for a given purpose.

5. Analyze characteristics and applications of searching (i.e., sequential, binary) and sorting (i.e., selection, insertion, merge) algorithms.

6. Analyze the characteristics and applications of propositional logic (e.g., De Morgan's laws).

4 Knowledge of programming languages

1. Identify characteristics and apply concepts of the Scratch™ programming language learning environment from the MIT Media Library.

2. Analyze segments of Java® code containing sequential, conditional, or iteration statements.

3. Analyze segments of Java® code involving methods, interacting objects, or passing parameters.

4. Apply principles of data types and data manipulation (e.g., string methods, arithmetic operations) in the Java® programming language.

5. Apply principles of abstraction, encapsulation, inheritance, and polymorphism in the Java® programming language.

5 Knowledge of computer hardware, software, and networking

1. Identify the hardware components of a computer system and their functions (e.g., input, output, processing, storage).

2. Analyze the advantages, disadvantages, or both of various data storage technologies.

3. Identify the characteristics and uses of various types of software (e.g., system, application).

4. Apply features and functions of application and productivity software (e.g., word processing, spreadsheet, database, multimedia authoring, Web development software).

5. Identify concepts and terminology related to networks (e.g., network protocols, Open Systems Interconnection model, client-server, cloud computing).

6. Identify characteristics and uses of network devices (e.g., servers, routers, switches, access points, workstations).

6 Knowledge of the historical aspects and social issues related to computer technologies

1. Identify examples of appropriate use (e.g., software license types, archival copying, fair use of copyrighted materials) and misuse (e.g., plagiarism, music and video piracy) of intellectual property.

The Scratch trademark is the property of MIT.
Java is a registered trademark of Oracle and/or its affiliates.

2. Identify milestones in the historical development of computer technology and important contributions of individuals or groups to the development of computer technology.

3. Analyze cultural, legal, and ethical issues and responsibilities of digital citizens, organizations, and government entities (e.g., privacy issues related to Internet use, data protection).

4. Analyze issues related to malicious software, social engineering, and security awareness.

5. Identify concepts and terminology related to security countermeasures (e.g., firewalls, antivirus programs, filtering software, encryption) that prevent, detect, and correct breaches.

6. Analyze security issues related to maintaining the confidentiality, integrity, and availability of information.

7 Knowledge of computer science pedagogy

1. Apply appropriate and effective classroom management strategies for teaching computer science (e.g., laboratory work, cooperative learning, electronic communications).

2. Apply appropriate and effective instructional strategies for teaching computer science (e.g., independent learning, case studies, role-playing, manipulatives, visualizations, simulations, modeling, team software development).

3. Apply appropriate and effective formative and summative assessment strategies for teaching computer science (e.g., rubrics, portfolios).

4. Apply appropriate and effective accommodations, adaptations, and strategies that ensure the equitable use of technology for diverse student populations (e.g., students with exceptionalities, English language learners, students from various socioeconomic levels).

5. Determine characteristics and apply uses of instructional technologies (e.g., collaborative online tools, social networking, computer-based learning, mobile devices).

6. Recognize opportunities, skills, and paths related to college and career readiness in the field of computer science.

7. Apply practices for planning and developing curricula that meet state and national standards and recognize resources for ongoing professional support and development.

Deaf or Hard of Hearing
K–12

Section 20

Deaf or Hard of Hearing K–12

1 Knowledge of philosophical, historical, legal, and educational foundations in the field of deaf education

1. Identify federal and Florida laws, regulations, and legal decisions that pertain to persons who are D/deaf or hard of hearing.

2. Analyze key communication philosophies and models (e.g., listening and spoken language, Total Communication, ASL-English bilingual) that provide the basis of educational practice.

3. Apply understanding of the rights and responsibilities of students who are D/deaf or hard of hearing, parents or guardians, teachers, other professionals, and educational programs.

4. Examine the foundations of deaf education, including the sociocultural, historical, and philosophical forces unique to deaf education.

5. Apply legal and ethical guidelines and practices in the field of deaf education (e.g., confidentiality, due process, referral, assessment, FAPE).

6. Identify the roles and responsibilities of teachers of students who are D/deaf or hard of hearing.

7. Determine appropriate activities, literature, resources, and references to support parent or guardian involvement in decisions regarding the student's social-emotional, communication, cognitive, and academic development.

8. Apply strategies for collaborating with a variety of support personnel (e.g., speech-language pathologists, paraprofessionals, general education inclusion facilitators, interpreters).

2 Knowledge of the anatomy and physiology of the auditory system and of hearing loss

1. Identify concepts and terminology related to the primary components and functions of the auditory system.

2. Determine the types and causes of hearing loss and comorbid disorders associated with specific etiologies.

3. Compare the nature and characteristics of unilateral, bilateral, conductive, mixed, sensorineural, progressive, and intermittent hearing loss.

4. Identify current educational definitions of hearing loss, identification criteria, and identification issues and incidence and prevalence data.

5. Determine appropriate types and uses of amplification systems and auditory devices (e.g., cochlear implants) and procedures for using and maintaining them.

3 Knowledge of language development and communication

1. Identify the phonological, semantic, morphemic, syntactic, and pragmatic components of language.

2. Identify typical stages and progressions of speech and language development (including listening and spoken language, signed language, and written language).

3. Analyze language samples of students who are D/deaf or hard of hearing using linguistic principles, including students who use ASL as well as students who use listening and spoken language.

4. Identify key elements of various modes of communication (e.g., ASL, listening and spoken language, various forms of manually coded English) and strategies for facilitating the communication.

5. Apply strategies and methods for developing students' expressive and receptive language proficiency (i.e., spoken and/or signed, and written).

6. Apply strategies for integrating language instruction across the curriculum and developing language meaningfully in authentic settings.

7. Apply strategies for planning and implementing instruction in the use of assistive technologies and communication devices (e.g., amplification, FM systems, captioning).

8. Identify the effects of sensory input (e.g., visual, tactile, auditory) on the development of language and cognition for students who are deafblind, D/deaf, hard of hearing, and other exceptionalities.

4 Knowledge of ASL and Deaf Culture

1. Demonstrate basic comprehension of a message in ASL.

2. Select the correct English interpretation when given a basic message in ASL.

3. Select the corresponding ASL interpretation when given a message in English.

4. Identify the cultural practices and defining characteristics unique to the Deaf Community.

5. Identify the differences between ASL and other signed communication systems.

6. Apply strategies for facilitating students' use of an ASL interpreter in social and academic settings.

7. Contrast the linguistic features of ASL with spoken English.

5 Knowledge of the design, development, and implementation of the Individual Family Service Plan, IEP, Transition Individual Education Plan, and Communication Plan

1. Identify the components of the Individual Family Service Plan, IEP, Transition Individual Education Plan, and Communication Plan.

2. Identify components and criteria of eligibility determination for students who are D/deaf or hard of hearing in the state of Florida.

3. Identify the roles and responsibilities of the additional professionals who provide educational, related, supplemental, and support services.

4. Identify the procedural safeguards outlined in IDEA and Section 504 as related to the education of students who are D/deaf or hard of hearing.

5. Analyze appropriate present level of performance statements based on specific assessment data for the following areas: communication, social-emotional, independent functioning, curriculum and learning, health, and transition.

6. Apply key elements to identify and evaluate measurable annual IEP and Transition Individual Education Plan goals based on present level of performance statements.

7. Identify components of a Communication Plan to determine the specific needs of a student who is D/deaf or hard of hearing.

8. Determine postsecondary programs and opportunities for students who are D/deaf or hard of hearing, given their career interests and abilities.

6 Knowledge of formal and informal assessments

1. Interpret the results of an audiological evaluation that includes unaided/aided test results.

2. Apply key terminology used in formal and informal assessments (e.g., audiological screenings, cognitive, academic, inventories, acoustic, environmental).

3. Distinguish between assessment instruments and procedures used for evaluating expressive and receptive language and speech perception and production of students with various types and degrees of hearing loss.

4. Apply methods to informally assess the communication, social-emotional, independent functioning, curriculum and learning, health, and transition skills of students who are D/deaf or hard of hearing.

5. Interpret assessment information to determine the curriculum needs of students who are D/deaf or hard of hearing.

6. Determine appropriate modifications and accommodations for formal and informal assessments and assessment procedures.

7. Determine appropriate considerations for the selection and use of instructional technology with students who are D/deaf or hard of hearing.

7 Knowledge of instructional strategies, accommodations, and modifications

1. Apply strategies to address environmental barriers to facilitate access to the total school environment and the curriculum (e.g., physical and nonphysical barriers affecting acoustics, accessibility, and communication).

2. Apply strategies and methods for promoting auditory skill development (e.g., auditory training strategies), including techniques for stimulating and using residual hearing.

3. Apply research- and evidence-based accommodations and modifications that provide access to the curriculum and the environment and that promote independence.

4. Use first- and second-language teaching strategies to provide instruction across content areas.

5. Apply research-based strategies and methods to teach literacy and content area reading and writing.

6. Apply research-based strategies and methods to teach skills across the curriculum (i.e., prevocational and vocational skills).

7. Apply strategies to promote students' skills in the areas of self-advocacy, personal responsibility, social competence, and independence.

Drama
6–12

Section 06

Drama 6–12

1 Knowledge of acting

1. Identify basic physiological processes of voice production.
2. Identify methods and purposes of physical and vocal warm-ups.
3. Identify common acting terms.
4. Identify various methods and approaches to actor training.
5. Identify the techniques for developing characterization.
6. Identify basic principles of stage movement and stage combat.
7. Identify basic techniques of pantomime.
8. Assess applications of improvisation techniques.
9. Differentiate between acting for multimedia and acting for the stage.

2 Knowledge of creative dramatics

1. Identify the objectives and fundamental processes of creative dramatics.
2. Identify methods and approaches to using creative dramatics in the classroom.

3 Knowledge of theatre production and design

1. Identify theatre safety practices.
2. Identify theatre production terminology.
3. Interpret basic ground/floor plans and elevations.
4. Identify basic elements of set construction and materials.
5. Identify basic elements and techniques of scene design and scene painting.
6. Identify basic elements and techniques of property design, materials, and construction.
7. Identify basic lighting design, techniques, and equipment.
8. Identify basic sound design, techniques, and equipment.
9. Identify basic elements of costume design and construction.

10. Identify basic makeup design, techniques, and materials.

11. Analyze solutions to facility problems.

12. Identify stage management responsibilities.

13. Identify theatre management responsibilities.

14. Identify production staff and basic crew responsibilities.

15. Identify ways of using computers in theatre production, management, and design.

16. Differentiate between production and design techniques for multimedia and the stage.

4 Knowledge of dramatic literature and criticism

1. Identify basic theatre styles and genres.

2. Identify and apply elements of plot structure and play analysis.

3. Identify the influences of major theorists and their works.

4. Identify cultural, political, and historical influences on dramatic literature.

5. Identify significant classical and contemporary contributions from diverse cultures.

6. Identify elements of assessment and critical reviewing for performance and production.

7. Identify the role and responsibilities of the dramaturg.

5 Knowledge of theatre history

1. Identify major periods in world theatre history.

2. Identify the influence of the major periods of world theatre on the design of the performance space.

3. Identify major theatre artists (e.g., playwrights, directors, designers, choreographers, performers) and their contributions.

4. Identify major periods in American theatre.

5. Identify significant dramatic works from the major periods of world theatre.

6. Identify contributors to and major developments in musical theatre.

6 Knowledge of directing

1. Identify criteria for script selection and procedures for securing scripts and production rights.
2. Analyze a script as it pertains to production elements.
3. Identify and interpret staging techniques.
4. Identify sources for researching a production.
5. Identify elements of the casting procedure and audition process.
6. Identify elements of the directing process.
7. Identify elements of the rehearsal process.
8. Identify the legal responsibilities of the director.
9. Identify the basics of directing a musical production.

7 Knowledge of playwriting

1. Identify the elements of dramatic form (e.g., plot, character, conflict, resolution, setting, dialogue, theme) as they apply to playwriting.
2. Differentiate between writing for multimedia and writing for the stage.

8 Knowledge of career opportunities

1. Identify career opportunities in theatre and the entertainment industry.
2. Identify advanced educational opportunities.
3. Identify professional theatre organizations and their functions.
4. Identify professional theatre and trade publications.

Earth-Space Science
6–12

Section 08

Earth-Space Science 6–12

1 Knowledge of the nature of science

1. Analyze processes of scientific inquiry.

2. Evaluate models used in science to explain patterns observed in nature (e.g., rock cycle, heliocentric, geocentric, nitrogen cycle, water cycle).

3. Identify the influences of science and society on each other.

4. Analyze the synergistic relationships between basic and applied research, technology, the economy, and the public good.

5. Evaluate the appropriate use of inferences, assumptions, observations, hypotheses, conclusions, laws, and theories.

6. Analyze scientific data presented in tables, graphs, and diagrams.

7. Differentiate between qualitative and quantitative data in experimental, observational, and modeling methods of research.

8. Apply state statutes and national guidelines regarding laboratory safety, hazardous materials, experimentation, and the use of organisms in the classroom.

9. Differentiate between the various roles of communication in the development of scientific ideas (e.g., collaboration, peer review, scientific debate).

10. Distinguish between accuracy, precision, systematic error, and random error, using significant figures appropriately.

11. Evaluate variables and affected outcomes for appropriate experimental designs with minimum bias.

12. Identify the equipment Earth and space scientists use to gather, analyze, and interpret data in field and laboratory investigations.

2 Knowledge of the composition, characteristics, and structure of Earth

1. Identify the characteristics of Earth's layers and the methods used to investigate Earth's interior.

2. Identify common rocks and minerals based on their physical and chemical properties.

3. Distinguish between igneous, metamorphic, and sedimentary rocks.

4. Identify processes and products within the rock cycle.

3 Knowledge of plate tectonics and related processes

1. Identify the historical development and supporting evidence that has led to the theory of plate tectonics.

2. Analyze the geologic processes involved in the movement of tectonic plates and the landforms produced by their movements.

3. Differentiate between the physical and chemical characteristics of oceanic crust and continental crust.

4. Identify the types, causes, and effects of volcanoes.

5. Identify the causes and effects of earthquakes.

6. Distinguish between the characteristics of seismic waves.

7. Identify how the movement of tectonic plates has influenced climate (e.g., hydrosphere, geosphere, biosphere).

4 Knowledge of Earth's surface processes

1. Compare physical and chemical weathering and their effects on landforms.

2. Analyze the principles and processes of sedimentation (i.e., erosion, deposition).

3. Identify the properties of aquifers and the movement of groundwater through sediments and rock formations.

4. Analyze the movement of water through the hydrologic cycle, including energy changes that occur as water changes phase.

5. Evaluate the origin and distribution of freshwater resources in Florida.

6. Discriminate between landforms and sedimentary deposits created by water, wind, and ice.

7. Identify the geologic features of Florida and the processes that produced them.

5 Knowledge of mapping and remote sensing

1. Identify surface features from topographic maps, photographs, and satellite images.

2. Interpret topographic and oceanographic maps.

3. Compare landforms illustrated on maps and imagery to geologic processes.

4. Evaluate the function and benefits of Earth-observing systems (e.g., Landsat, Topex, aircraft, balloons).

5. Identify the applications of remote sensing technologies used on Earth and in space science (e.g., magnetometry, seismic survey, ground-penetrating radar, high-resolution photography).

6 Knowledge of the scope and measurement of geologic time

1. Identify appropriate methods of absolute and relative dating for given situations.

2. Apply the law of original horizontality, the principle of superposition, and the principle of cross-cutting relationships to interpret geologic cross sections.

3. Identify major events in Earth's history (e.g., mass extinctions, evolution of plants, development of an oxygen-rich atmosphere).

4. Identify major events in Florida's geologic history, including sea-level changes.

5. Interpret fossils and geologic evidence to reconstruct Earth's history.

7 Knowledge of the characteristics and management of Earth's resources

1. Identify characteristics of renewable and nonrenewable resources.

2. Evaluate management strategies for renewable and nonrenewable resources.

3. Assess the use and management of Florida's geologic, marine, and environmental resources.

4. Compare various energy production technologies (e.g., fossil fuels, nuclear, solar) and their past, present, and future consequences to the environment.

5. Identify the impact of humans on Earth (e.g., deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water).

8 Knowledge of oceans and coastal processes

1. Identify the characteristics of ocean basins, continental shelves, and coral reefs.

2. Identify the geologic features of coastal geomorphic structures (e.g., barrier islands, estuaries, sandbars, capes, deltas, coral reefs).

3. Analyze the movement of water through waves, tides, and currents.

4. Identify the chemical, physical, and biological characteristics of seawater.

5. Determine the causes and effects of surface currents, coastal upwelling, and density-driven (i.e., thermohaline) circulation.

6. Identify the effects of human activity on the coastal and marine environment.

9 Knowledge of factors that influence atmospheric conditions and weather

1. Analyze the composition and structure of the atmosphere and how it protects life and insulates the planet.

2. Differentiate between the sources, characteristics, and movement of air masses (e.g., maritime, continental, polar, tropical).

3. Identify characteristics of high and low pressure systems, including the formation of fronts and severe weather systems.

4. Identify factors that cause local winds (i.e., land and sea breezes) and global winds (e.g., pressure belts, Coriolis effect).

5. Determine how the transfer of energy throughout the atmosphere influences weather conditions (e.g., hydrologic cycle).

6. Interpret weather maps and the indicated atmospheric conditions.

7. Evaluate how local weather is affected by geographic features (e.g., proximity to bodies of water, urban versus rural settings, unequal heating of land and water).

8. Identify characteristics of weather systems that affect Florida.

9. Identify how global climate influences, such as jet streams and ocean currents, affect weather (e.g., El Niño).

10 Knowledge of Earth's climate patterns

1. Identify the factors that contribute to the climate of a geographic area.

2. Identify the causes and effects of climate changes throughout Earth's history.

3. Assess how the cycling of carbon, energy, and water between the geosphere, hydrosphere, and atmosphere affects climate.

4. Determine the effects of climate phenomena (e.g., monsoons, jet streams, El Niño).

5. Identify how climate changes may affect Florida's surface features, weather patterns, and biological diversity.

11 Knowledge of astronomical objects and processes

1. Identify the characteristics (e.g., mass, composition, location) of the major and minor objects in the solar system.

2. Identify types and characteristics of deep space objects (e.g., quasars, galaxies, pulsars, black holes).

3. Interpret the Hertzsprung-Russell diagram with regard to stellar evolution and star characteristics.

4. Interpret the sequences and forces involved in the origin and evolution of the solar system.

5. Identify the causes and effects of the cycles of the Earth-Moon-Sun system (e.g., seasons, tides, eclipses, precession, moon phases).

6. Identify the physical properties of the Sun, its dynamic nature, and its effects on Earth systems.

7. Identify the matter and forces involved in the evolution of the universe (e.g., big bang theory).

12 Knowledge of space exploration

1. Compare relative and absolute methods for measurement of astronomical distances.

2. Evaluate functions and benefits of the different types of ground- and space-based astronomical instruments (e.g., x-ray, optical, infrared, radio telescopes, spectrometers).

3. Interpret electromagnetic spectra and radiation intensity data from astronomical objects.

4. Identify significant manned and unmanned space exploration events, programs, and objectives.

5. Identify the historical development of astronomy based on the contributions of Aristotle, Ptolemy, Copernicus, Brahe, Kepler, Galileo, Newton, Einstein, and Hubble.

6. Evaluate the cultural and economic effects of the space program in Florida.

Educational Media Specialist PK–12

Section 10

Educational Media Specialist PK–12

1 Knowledge of professional organizations, resources, and national and state guidelines and standards for the school library media specialist

1. Identify state and national school library media professional associations and professional resources.
2. Identify the major concepts of the national guidelines and their effects on the roles of the school library media specialist.
3. Identify state and national guidelines for information and media literacy skills.

2 Knowledge of teaching and learning principles of the school library media specialist

1. Identify best practices for working with diverse learning styles to meet specific learning and information needs.
2. Select the most appropriate media formats to meet a specific learning need.
3. Differentiate among resources that reflect multiple literacies.

3 Knowledge of the instructional partner responsibilities of the school library media specialist

1. Identify collaborative opportunities for curricular and instructional planning.
2. Identify methods for keeping abreast of changes in curriculum.
3. Identify the components of an instructional planning process.
4. Identify the school library media specialist's role on the instructional planning team.

4 Knowledge of teaching methods for implementing multiple literacies

1. Identify strategies for developing students' multiple literacies.
2. Identify activities for developing students' ability to inquire, think critically, and gain knowledge.
3. Identify activities whereby students can draw conclusions, make informed decisions, apply knowledge to new situations, and create new knowledge.
4. Assess the effectiveness of teaching methods used to implement national and state standards for multiple literacies.

5. Identify activities that assist students in analyzing, evaluating, and ethically using information.

6. Identify ways for encouraging students to develop the habit of using resources and information agencies for personal and aesthetic growth.

7. Identify strategies that promote safe and ethical behaviors in personal electronic communication and interaction.

8. Identify components of research process models.

5 Knowledge of methods for teaching and assisting the school learning community in design and production of various types of media

1. Identify when it is appropriate to design and produce various types of media.

2. Determine what media should be produced to meet a specific instructional need.

3. Identify techniques for planning, designing, and evaluating media products.

4. Identify basic methods for producing resources and presentations, using all available technologies.

6 Knowledge of design and delivery of staff development

1. Identify the elements of effective staff development.

2. Identify methods for teaching staff how to use equipment and technologies.

3. Identify methods for teaching staff how to select, use, evaluate, and produce media.

4. Identify methods for assisting staff in the application of new and emerging technologies to meet varied learning needs.

5. Determine the relevance of topics for staff development.

7 Knowledge of the information specialist responsibilities of the school library media specialist

1. Identify effective methods for selecting resources that meet the information needs of the learning community.

2. Identify the characteristics of an effective system for organizing information resources to meet the needs of students and staff.

3. Identify factors that influence access to information.

4. Identify relevant information agencies and resources outside the school.

5. Identify considerations for participation in resource sharing.

6. Identify strategies for providing specific information in response to reference requests.

7. Identify the most appropriate resources for responding to a specific information need.

8 Knowledge of resources in all formats for the learning community

1. Identify resources that are recognized as outstanding in their medium.

2. Identify authors who are recognized as outstanding in their genre.

3. Identify illustrators who are recognized as outstanding in their medium.

9 Knowledge of the foundations, designing, planning, and development of a school library media program

1. Identify the effects of societal changes on the evolution of school library media program standards and guidelines.

2. Identify the contributions of notable school library leaders.

3. Identify school and student characteristics that influence the mission of the school library media program.

4. Identify components of strategic planning for a school library media program.

5. Identify ways the school library media program can support school improvement.

10 Knowledge of procedures to assess and evaluate the effectiveness of a school library media program

1. Identify components, participants, and strategies for a comprehensive evaluation of the school library media program.

2. Identify strategies for collecting information to determine the impact of the school library media program.

3. Identify methods and strategies for analyzing and evaluating data to plan and implement modifications to the school library media program.

11 Comprehension of skills required to plan, prepare, advocate, and administer a budget

1. Identify methods for effectively planning, preparing, and administering a school library media budget based on both the needs of the learning community and the program's short- and long-term goals.

2. Identify funding sources that support school library media programs.

3. Identify strategies for effectively communicating budget needs.

12 Knowledge of supervision of staff and volunteers for the school library media program

1. Distinguish between professional responsibilities and paraprofessional activities.

2. Identify appropriate methods for instructing, supervising, and evaluating school library media staff, student assistants, and volunteers.

13 Knowledge of policies and procedures used in the school library media program

1. Distinguish between a policy and a procedure.

2. Identify the rationale for and components of a school library media policies and procedures document.

14 Knowledge of methods for creating an active learning environment

1. Identify the elements of an effective school library media facility that is compliant with the Americans with Disabilities Act.

2. Identify factors that affect the school library media center climate.

3. Identify strategies for extending the school library media program beyond the walls of the school library media center.

15 Knowledge of methods for advocating an effective school library media program

1. Select methods for identifying users and nonusers of the school library media program.

2. Identify techniques to attract and retain school library media users.

3. Identify strategies for promoting and eliciting support for the school library media program.

4. Identify strategies for the dissemination of research findings about the relationship between effective school library media programs and student achievement.

16 Knowledge of policies and procedures for collection development

1. Identify the elements of a collection development policy.

2. Identify criteria for evaluating, selecting, and weeding all forms of media and technology.

3. Identify selection tools and reviewing sources for a specific need.

4. Apply selection criteria to determine whether a given resource should be included in a collection.

5. Identify methods for communicating policies and procedures for collection development and for ensuring that the collection meets the current needs of the instructional program and learning community.

6. Identify components and terminology of the acquisitions process.

7. Identify the characteristics of a collection development plan.

17 Knowledge of policies and processes for managing, cataloging, organizing, circulating, and maintaining resources

1. Identify the components of a circulation policy that ensures accessibility to resources.

2. Identify the elements of an automated library management system.

3. Identify methods for analyzing and using data provided by the library management system.

4. Apply standardized techniques to maintain bibliographic integrity.

5. Identify the basic resources used in original cataloging.

6. Identify the fields of a bibliographic record.

7. Identify purposes of and procedures for conducting a school library media collection inventory.

18 Comprehension of leadership and interpersonal skills for the school library media specialist

1. Identify ways to promote collaborative relationships between school library media staff and the learning community.

2. Identify leadership opportunities and strategies for a school library media specialist's involvement in the school program and the community.

3. Identify leadership opportunities and strategies for a school library media specialist's involvement in the profession.

19 Knowledge of state and national legislation and their effects on the school library media program

1. Identify the effects of state legislation on school library media programs.

2. Identify the effects of national legislation on school library media programs.

20 Knowledge of current professional trends and issues of the school library media program

1. Identify the implications of various scheduling models.
2. Identify the implications of shared resources on the school library media program.
3. Identify resources that indicate trends in teaching and learning.
4. Identify the impact of standards-based testing on the school library media program.
5. Identify research findings on motivating school learners to use the school library media center.

21 Knowledge of research related to the school library media program

1. Identify cornerstone research pertaining to the school library media program and its relationship to student achievement.
2. Interpret research data.
3. Identify ways research can be applied to the school library media program.
4. Analyze problems using action research.

22 Knowledge of professional ethics for the school library media specialist

1. Identify an ethical course of action for a copyright or plagiarism issue.
2. Identify an ethical course of action related to the principles of intellectual freedom.
3. Identify an ethical course of action for a privacy or confidentiality issue.
4. Identify the impact of court cases pertaining to copyright.

23 Knowledge of methods for providing equity, diversity, and global perspectives in the school library media program

1. Identify appropriate resources for multicultural and multilingual populations.
2. Identify resources that meet the needs of students with various learning styles, abilities, and disabilities.
3. Identify strategies for providing equitable access to school library media resources and services.
4. Identify strategies for helping students develop diverse and global perspectives.

24 Knowledge of methods for integrating technology into the instructional program

1. Identify strategies for assessing technology competency.

2. Identify appropriate digital resources for completing a variety of information and media literacy tasks.

3. Identify appropriate digital resources and technologies for presenting and sharing information.

4. Identify adaptive or assistive technology for providing learning opportunities for students with various abilities.

5. Identify ways to use technology to communicate with the school learning community.

6. Apply strategies that integrate appropriate technology into the instructional program.

25 Knowledge of reading research and strategies

1. Identify reading promotion activities that support the instructional program, encourage reading for pleasure, and meet individual student interests and needs.

2. Identify various methods for assessing student reading levels.

3. Identify methods for differentiating instruction based on student reading data.

4. Identify ways to incorporate the five scientifically based reading research principles into the school library media program.

5. Identify strategies for integrating literature into the instructional program.

6. Identify effective instructional methods for developing students' reading skills.

7. Identify instructional methods and strategies for facilitating students' development and use of content area vocabulary.

8. Identify instructional methods for facilitating students' reading comprehension.

Elementary Education
K–6

Subtests in the Following Areas:

Language Arts and Reading
Social Science
Science
Mathematics

Section 60

Elementary Education K–6
Language Arts and Reading

1 Knowledge of the reading process

1. Identify and apply evidence-based practices to develop emergent literacy (e.g., oral language development, phonological awareness, alphabet knowledge, phonics) and early literacy (e.g., phonemic awareness, phonics, fluency, vocabulary, comprehension).

2. Identify appropriate stages of word recognition that lead to effective decoding (e.g., pre-alphabetic, partial-alphabetic, full-alphabetic, consolidated alphabetic, automatic stages).

3. Select and apply evidence-based practices for the development of decoding skills (e.g., blending and segmenting phonemes, continuous blending of graphemes and phonemes, syllabication, morphology).

4. Distinguish among the components of reading fluency (e.g., accuracy, automaticity, rate, prosody).

5. Select and apply evidence-based practices for developing reading fluency (e.g., practice with high-frequency words, grade-level texts, and grade-level sight words).

6. Identify and apply evidence-based practices for increasing vocabulary acquisition, reinforcing learned vocabulary, and integrating vocabulary across the content areas (e.g., word analysis, author's word choice, context clues, multiple exposures).

7. Identify and apply evidence-based practices for facilitating students' comprehension of informational and literary texts (e.g., summarizing, self-monitoring, questioning, using graphic and semantic organizers, modeling think-alouds, recognizing text structure).

8. Select and apply essential comprehension skills (e.g., recognizing central ideas and supporting details and facts, making inferences, drawing conclusions).

9. Analyze information presented in a variety of formats for different purposes (e.g., charts, tables, graphs, pictures, print and nonprint media).

2 Knowledge of texts and text analysis

1. Differentiate among characteristics and elements of a variety of texts (e.g., realistic fiction, fantasy, poetry, informational texts).

2. Identify and analyze the use of literary devices (e.g., simile, metaphor, personification, onomatopoeia, hyperbole) and rhetorical appeals in literary and informational texts.

3. Evaluate and select a variety of texts based on purpose, relevance, and appropriateness.

4. Identify and apply evidence-based practices for facilitating students' analysis of, reflection on, and response to texts (e.g., think-pair-share, evidence-based discussion).

5. Analyze informational and argumentative texts for the central ideas and authors' claims (e.g., by using purpose, evidence, and reasoning).

6. Select and apply strategies for developing students' critical-reading skills (e.g., understand text features and text structures, explain author's purpose or claims, identify supporting evidence, interpret figurative language, compare and contrast across texts).

3 Knowledge of the writing process

1. Identify and evaluate the developmental stages of writing (e.g., drawing, dictating, writing).

2. Differentiate the stages of the writing process (i.e., prewriting, planning, drafting, revising, editing, and publishing).

3. Distinguish among the modes of writing (e.g., narrative, expository, argumentative) and select the appropriate mode of writing for a variety of occasions, purposes, and audiences.

4. Identify and apply instructional methods for teaching writing conventions (e.g., spelling, punctuation, capitalization, grammar, word usage).

5. Determine and apply evidence-based practices for teaching expository, narrative, and argumentative writing, including how to use precise language, figurative language, transitional words and phrases, dialogue, and sentence variety.

4 Knowledge of literacy instruction and assessments

1. Analyze and distinguish among the purposes and characteristics of different types of assessments (e.g., norm referenced, criterion referenced, diagnostic, curriculum based).

2. Select and apply oral and written methods for assessing student progress (e.g., informal reading inventories, fluency checks, rubrics, retellings, portfolios).

3. Analyze assessment data (e.g., screening, progress monitoring, diagnostic) to guide instructional decisions and differentiate instruction.

4. Analyze and interpret students' formal and informal assessment results to inform students and stakeholders.

5. Select appropriate classroom organizational formats (e.g., literature circles, small groups, conferences, workshops, reading centers, multiage groups) for specific instructional objectives.

6. Identify and apply evidence-based practices for the diagnosis, prevention, and intervention of common literacy difficulties.

5 Knowledge of communication and media literacy

1. Identify a variety of listening and speaking strategies (e.g., questioning, paraphrasing, vocal qualities, nonverbal cues).

2. Identify and apply instructional methods for developing students' abilities to use collaborative techniques and active-listening and speaking skills (e.g., discussing claims and justifying reasoning, building on ideas, propelling the conversation, using appropriate voice and tone).

3. Determine and apply instructional methods for teaching students how to conduct research by using a variety of reliable and valid sources (e.g., Internet, printed materials, artifacts, visual media, primary sources).

4. Determine and apply ethical processes (e.g., citation, paraphrasing) for collecting and presenting authentic information and avoiding plagiarism.

5. Select and apply strategies for guiding students in selecting multimedia elements to emphasize and enhance oral and written tasks.

Elementary Education K–6
Social Science

1 Knowledge of effective instructional practice and assessment of the social sciences

1. Select appropriate resources for instructional delivery of social science concepts, including complex informational text.
2. Identify appropriate resources for planning for instruction of social science concepts.
3. Choose appropriate methods for assessing social science concepts.
4. Determine appropriate learning environments for social science lessons.

2 Knowledge of time, continuity, and change (i.e., history)

1. Identify and analyze historical events that are related by cause and effect.
2. Analyze the sequential nature of historical events using timelines.
3. Analyze examples of primary and secondary source documents for historical perspective.
4. Analyze the impacts of the cultural contributions and technological developments of Africa; the Americas; Asia, including the Middle East; and Europe.
5. Identify the significant historical leaders and events that have influenced Eastern and Western civilizations.
6. Determine the causes and consequences of exploration, settlement, and growth on various cultures.
7. Interpret the ways that individuals and events have influenced economic, social, and political institutions in the world, nation, or state.
8. Analyze immigration and settlement patterns that have shaped the history of the United States.
9. Identify how various cultures contributed to the unique social, cultural, economic, and political features of Florida.
10. Identify the significant contributions of the early and classical civilizations.

3 Knowledge of people, places, and environment (i.e., geography)

1. Identify and apply the six essential elements of geography (i.e., the world in spatial terms, places and regions, physical systems, human systems, environment and society, uses of geography), including the specific terms for each element.

2. Analyze and interpret maps and other graphic representations of physical and human systems.

3. Identify and evaluate tools and technologies (e.g., maps, globe, GPS, satellite imagery) used to acquire, process, and report information from a spatial perspective.

4. Interpret statistics that show how places differ in their human and physical characteristics.

5. Analyze ways in which people adapt to an environment through the production and use of clothing, food, and shelter.

6. Determine the ways tools and technological advances affect the environment.

7. Identify and analyze physical, cultural, economic, and political reasons for the movement of people in the world, nation, or state.

8. Evaluate the impact of transportation and communication networks on the economic development in different regions.

9. Compare and contrast major regions of the world, nation, or state.

4 Knowledge of government and the citizen (i.e., government and civics)

1. Distinguish between the structure, functions, and purposes of federal, state, and local government.

2. Compare and contrast the rights and responsibilities of a citizen in the world, nation, state, and community.

3. Identify and interpret major concepts of the U.S. Constitution and other historical documents.

4. Compare and contrast the ways the legislative, executive, and judicial branches share powers and responsibility.

5. Analyze the U.S. electoral system and the election process.

6. Identify and analyze the relationships between social, economic, and political rights and the historical documents that secure these rights in the United States.

7. Identify and analyze the processes of the U.S. legal system.

5 Knowledge of production, distribution, and consumption (i.e., economics)

1. Determine ways that scarcity affects the choices made by governments and individuals.

2. Compare and contrast the characteristics and importance of currency.

3. Identify and analyze the role of markets from production through distribution to consumption.

4. Identify and analyze factors to consider when making consumer decisions.

5. Analyze the economic interdependence between nations (e.g., trade, finance, movement of labor).

6. Identify human, natural, and capital resources and evaluate how these resources are used in the production of goods and services.

Elementary Education K–6
Science

1 Knowledge of effective science instruction

1. Analyze and apply developmentally appropriate researched-based strategies for teaching science practices.

2. Select and apply safe and effective instructional strategies to utilize manipulatives, models, scientific equipment, real-world examples, and print and digital representations to support and enhance science instruction.

3. Identify and analyze strategies for formal and informal learning experiences to provide a science curriculum that promotes students' innate curiosity and active inquiry (e.g., hands-on experiences, active engagement in the natural world, student interaction).

4. Select and analyze collaborative strategies to help students explain concepts, to introduce and clarify formal science terms, and to identify misconceptions.

5. Identify and apply appropriate reading strategies, mathematical practices, and science-content materials to enhance science instruction for learners at all levels.

6. Apply differentiated strategies in science instruction and assessments based on student needs.

7. Identify and apply ways to organize and manage a classroom for safe, effective science teaching that reflect state safety procedures and restrictions (e.g., procedures, equipment, disposal of chemicals, classroom layout, use of living organisms).

8. Select and apply appropriate technology, science tools and measurement units for students' use in data collection and the pursuit of science.

9. Select and analyze developmentally appropriate diagnostic, formative and summative assessments to evaluate prior knowledge, guide instruction, and evaluate student achievement.

10. Choose scientifically and professionally responsible content and activities that are socially and culturally sensitive.

2 Knowledge of the nature of science

1. Analyze the dynamic nature of science models, laws, mechanisms, and theories that explain natural phenomena (e.g., durability, tentativeness, replication, reliance on evidence).

2. Identify and apply science and engineering practices through integrated process skills (e.g., observing, classifying, predicting, hypothesizing, designing and carrying out investigations, developing and using models, constructing and communicating explanations).

3. Differentiate between the characteristics of experiments (e.g., multiple trials, control groups, variables) and other types of scientific investigations (e.g., observations, surveys).

4. Identify and analyze attitudes and dispositions underlying scientific thinking (e.g., curiosity, openness to new ideas, appropriate skepticism, cooperation).

5. Identify and select appropriate tools, including digital technologies, and units of measurement for various science tasks.

6. Evaluate and interpret pictorial representations, charts, tables, and graphs of authentic data from scientific investigations to make predictions, construct explanations, and support conclusions.

7. Identify and analyze ways in which science is an interdisciplinary process and interconnected to STEM disciplines (i.e., science, technology, engineering, mathematics).

8. Analyze the interactions of science and technology with society including cultural, ethical, economic, political, and global factors.

3 Knowledge of physical sciences

1. Identify and differentiate among the physical properties of matter (e.g., mass, volume, texture, hardness, freezing point).

2. Identify and differentiate between physical and chemical changes (e.g., tearing, burning, rusting).

3. Compare the properties of matter during phase changes through the addition and/or removal of energy (e.g., boiling, condensation, evaporation).

4. Differentiate between the properties of homogeneous mixtures (i.e., solutions) and heterogeneous mixtures.

5. Identify examples of and relationships among atoms, elements, molecules, and compounds.

6. Identify and compare potential and kinetic energy.

7. Differentiate among forms of energy, transformations of energy, and their real-world applications (e.g., chemical, electrical, mechanical, heat, light, sound).

8. Distinguish among temperature, heat, and forms of heat transfer (e.g., conduction, convection, radiation).

9. Analyze the functionality of an electrical circuit based on its conductors, insulators, and components.

10. Identify and apply the characteristics of contact forces (e.g., push, pull, friction), at-a-distance forces (e.g., magnetic, gravitational, electrostatic), and their effects on matter (e.g., motion, speed).

4 Knowledge of Earth and space

1. Identify characteristics of geologic formations (e.g., volcanoes, canyons, mountains) and the mechanisms by which they are changed (e.g., physical and chemical weathering, erosion deposition).

2. Identify and distinguish among major groups and properties of rocks and minerals and the processes of their formations.

3. Identify and analyze the characteristics of soil, its components and profile, and the process of soil formation.

4. Identify and analyze processes by which energy from the Sun is transferred (e.g., radiation, conduction, convection) through Earth's systems (e.g., biosphere, hydrosphere, geosphere, atmosphere, cryosphere).

5. Identify and analyze the causes and effects of atmospheric processes and conditions (e.g., water cycle, weather, climate).

6. Identify and analyze various conservation methods and their effectiveness in relation to renewable and nonrenewable natural resources.

7. Analyze the Sun-Earth-Moon system in order to explain repeated patterns such as day and night, phases of the Moon, tides, and seasons.

8. Compare and differentiate the composition and various relationships among the objects of our Solar System (e.g., Sun, planets, moons, asteroids, comets).

9. Identify major events in the history of space exploration and their effects on society.

5 Knowledge of life science

1. Identify and compare the characteristics of living and nonliving things.

2. Analyze the cell theory as it relates to the functional and structural hierarchy of all living things.

3. Identify and compare the structures and functions of plant and animal cells.

4. Classify living things into major groups (i.e., Linnaean system) and compare according to characteristics (e.g., physical features, behaviors, development).

5. Compare and contrast the structures, functions, and interactions of human and other animal organ systems (e.g., respiration, reproduction, digestion).

6. Distinguish among infectious agents (e.g., viruses, bacteria, fungi, parasites), their transmission, and their effects on the human body.

7. Identify and analyze the processes of heredity and natural selection and the scientific theory of evolution.

8. Analyze the interdependence of living things with each other and with their environment (e.g., food webs, ecosystems, pollution).

9. Identify and analyze plant structures and the processes of photosynthesis, transpiration, and reproduction (i.e., sexual, asexual).

10. Predict the responses of plants to various stimuli (e.g., heat, light, gravity).

11. Identify and compare the life cycles and predictable ways plants and animals change as they grow, develop, and age.

Elementary Education K–6
Mathematics

1 Knowledge of integers, decimals, and fractions in base-10

1. Apply concepts of prime and composite numbers, multiples, and factors in performing arithmetic operations with integers and fractions.

2. Identify and apply arithmetic strategies based on place value (e.g., composing decomposing, regrouping, compensating) to perform multi-digit operations.

3. Compare integers, decimals, and fractions (e.g., integers and positive fractions with positive exponents, rounding) and identify their positions on a number line.

4. Apply the four arithmetic operations to solve problems involving integers, decimals, fractions, and percentages, represented by visual models, equations, and algorithms.

5. Identify and apply strategies for building fluency with addition, subtraction, and multiplication of multi-digit whole numbers (e.g., visual models, partial sums and products, arrays and area models, compensation, inverse relationship between addition and subtraction and between multiplication and division).

6. Select appropriate representations (e.g., number line, area, set model) for problems or solutions involving fractions.

2 Knowledge of algebraic reasoning

1. Interpret and extend multiple representations of numerical patterns and linear relationships represented by tables, graphs, equations, expressions, and verbal descriptions.

2. Select an algebraic expression, equation, or inequality that represents a real-world situation.

3. Apply operations (e.g., associative, commutative, distributive properties) and the properties of equality to solve single-variable equations and inequalities, and determine whether two algebraic expressions are equivalent.

4. Apply the concept of substitution to evaluate algebraic expressions with integer coefficients (e.g., expressions with exponents, expressions with nested parentheses).

5. Analyze and apply methods (e.g., models, estimation, reasonableness of solutions) to solve mathematical and real-world multistep problems (e.g., fractions, decimals, interpreting remainders within context) involving any of the four arithmetic operations.

6. Solve mathematical and real-world problems involving comparisons, mixtures, measurement conversions, percentages, rates and unit rates, using ratios to represent relationships between numerical quantities.

3 Knowledge of measurement, data analysis, and statistics

1. Calculate and evaluate the appropriateness of statistical measures of central tendency and variability based on real-world context and the shape of the data distribution.

2. Analyze and interpret rational number data presented in various ways (i.e., stem-and-leaf plots, box plots, line plots, histograms, tables, bar graphs, circle graphs).

3. Convert standard measurement units within the same measurement system (e.g., metric, U.S. customary) to solve single- and multi-step, mathematical, and real-world problems.

4. Select appropriate units to solve problems involving measurement and estimation of time, money, distance, volume, mass/weight, and temperature.

4 Knowledge of geometric concepts

1. Apply geometric properties and relationships to solve real-world problems involving perimeter and area of triangles and quadrilaterals (e.g., figures that can be decomposed into triangles and quadrilaterals; figures with decimal, fractional, or unknown side lengths).

2. Apply geometric properties and relationships to solve real-world problems involving volume and surface area of right rectangular prisms and right rectangular pyramids using nets and volume of right rectangular prisms (e.g., figures with decimal, fractional, or unknown side lengths, decomposing figures into right rectangular prisms and pyramids).

3. Select ordered pairs of rational numbers, and determine the perimeter and area of rectangles plotted on the coordinate plane by calculating distances between two points with a common coordinate.

4. Classify attributes (e.g., number of sides, lengths of sides, right angles, lines of symmetry) of 2D figures in a hierarchy based on mathematical properties (e.g., a rectangle is also a trapezoid).

5. Classify attributes (e.g., number of faces, lengths of edges, straight or curved edges) of 3D figures (e.g., prisms, pyramids, cylinders, spheres), using mathematical terms (e.g., faces, edges, vertices).

6. Identify and evaluate angles (e.g., the use of the additive property of angle measure to determine unknown angle measures) and relationships between lines, using mathematical terminology (e.g., acute, obtuse, straight, reflex, parallel, perpendicular).

5 Knowledge of student reasoning and instructional practices

1. Identify and apply appropriate mathematical concepts, procedures, skills, and professional vocabulary to evaluate student work.

2. Analyze and interpret individual student mathematics assessment data (e.g., diagnostic, formative, progress monitoring, summative) to guide instructional decisions and differentiate instruction.

3. Select and analyze instructional methods and tools, including technology (e.g., interactive whiteboards, computers), for small and large groups of students according to the cognitive complexity of a task and students' needs.

4. Analyze learning progressions to demonstrate how students' mathematical knowledge and skills develop over time among concrete, representational, and abstract modes of understanding.

5. Distinguish among the stages of students' mathematical fluency (i.e., exploration, procedural reliability, procedural fluency) and recognize the role played by automaticity in each of those stages.

6. Identify and apply the use of mathematical thinking (e.g., use of patterns, structures, real-world contexts, and multiple representations; assessing the reasonableness of solutions).

7. Identify and apply instructional methods to reinforce connections between mathematical topics within a grade level, across subject areas within a grade level, and the progression of mathematical topics from one grade level to the next.

8. Identify and apply appropriate instructional strategies for problem solving (e.g., drawing a picture, making a table, acting it out, writing an expression or equation).

Engineering and Technology Education 6–12

Section 55

Engineering and Technology Education 6–12

1 Knowledge of the nature and impacts of technology

1. Identify the characteristics of technology.
2. Analyze a technological system in terms of inputs, processes, outputs, and feedback.
3. Assess the role of technology in developing products and systems that solve problems.
4. Evaluate the historical, social, ethical, cultural, economic, political, and environmental causes and effects of technological development and change.
5. Identify and assess new, emerging, and developing technologies and their impacts on society.
6. Identify biotechnology applications and advances in the areas of agriculture, pharmaceuticals, food and beverages, medicine, energy, environment, and genetic engineering.

2 Knowledge of principles of drafting

1. Select appropriate drafting instruments, equipment, and materials for a given purpose.
2. Differentiate between various disciplines of drafting (e.g., architectural, electrical, mechanical).
3. Apply fundamental principles of drafting (e.g., line conventions, lettering, dimensioning, scale, measurement, graphing).
4. Analyze the types of drawings used in drafting (e.g., orthographic, pictorial, auxiliary view).
5. Select appropriate 3D modeling processes for a given purpose.
6. Identify components of hardware and software for CAD.

3 Knowledge of principles of engineering

1. Identify appropriate design and problem-solving principles and procedures in engineering design.
2. Analyze factors involved in engineering design (e.g., economic, safety, ergonomic, reliability).
3. Analyze data acquisition methods in engineering (e.g., the use of test equipment, measurement instruments, research techniques).

4. Analyze legal and ethical issues in engineering.

4 Knowledge of energy and power technologies

1. Analyze the characteristics of power (e.g., steam, fluid power, electrical, solid and liquid fuels, nuclear, solar) and methods of generation and distribution.

2. Analyze the economic, social, and environmental impacts of traditional and alternative energy sources.

3. Select appropriate tools and materials used in various energy and power technologies.

4. Identify characteristics of AC and DC circuits and their components (e.g., source, load, path).

5. Apply Ohm's law and Kirchhoff's law to series and parallel circuits.

6. Distinguish between the characteristics of analog and digital circuits.

5 Knowledge of information and communication technologies

1. Analyze communication systems in terms of their components (i.e., source, encoder, transmitter, receiver, decoder, storage, retrieval, destination).

2. Analyze the tools, machines, equipment, and sources used in multiple forms of communications (e.g., human to human, machine to machine, human to machine, machine to human).

3. Apply the design process (e.g., storyboarding, wireframes, compositions) for various media.

4. Apply appropriate hardware and software application components for Web-based, audiovisual, and print media.

5. Select the most appropriate form of communication for a given task (e.g., traditional versus emerging technologies).

6. Classify the elements (e.g., color, shape, lines) and principles of design (e.g., balance, rhythm, emphasis).

7. Distinguish between the types, characteristics, components, and processes of prepress operations (e.g., generating and manipulating images, desktop publishing, typography).

8. Identify the characteristics and components of major printing processes (e.g., screen, offset, digital, sublimation).

6 Knowledge of transportation technologies

1. Analyze transportation systems, their subsystems (i.e., structural, propulsion, suspension, guidance, control, support), and their components.

2. Analyze transportation processes (e.g., receiving, holding, shipping) and systems (e.g., railways, pipelines).

3. Select appropriate transportation systems or components for land, sea, air, and space.

4. Analyze legal and ethical issues related to transportation (e.g., environmental regulations, governmental regulations, safety).

7 Knowledge of manufacturing technologies

1. Select appropriate tools, machinery, and equipment used for manufacturing.

2. Analyze types of manufacturing (e.g., job-lot, custom, mass production) and their characteristics.

3. Analyze legal and ethical issues related to manufacturing (e.g., environmental regulations, safety procedures, labeling requirements).

4. Select appropriate manufacturing management systems (e.g., just-in-time, continuous, lean, FMS).

5. Analyze factors affecting choices in manufacturing processes (e.g., rapid prototyping, CAM, CNC, CIM), including emerging technologies.

6. Select appropriate materials according to their properties and characteristics (e.g., strength, weight, costs, environmental impact).

8 Knowledge of construction technologies

1. Differentiate between characteristics of residential, commercial, civil, and industrial construction.

2. Analyze structural systems, their subsystems, and their components.

3. Select appropriate tools, equipment, materials, and processes in construction.

4. Identify the constraints (e.g., building codes, environmental sustainability, structural forces) that affect residential, commercial, civil, and industrial construction and renovation.

5. Evaluate factors involved in estimating, bidding, and scheduling.

9 Knowledge of laboratory management and safety

1. Evaluate the requirements for safety precautions and practices in technology education laboratories for staff and all students.

2. Identify student guidelines and processes for safe, functional use, storage, and maintenance of tools, machines, and equipment.

3. Identify student guidelines and processes for safe, functional use, storage, and disposal of materials and supplies.

4. Select precautions and practices in preventing and extinguishing different classes of fires.

5. Identify components of a comprehensive safety program for work and learning spaces (e.g., emergency procedures, OSHA regulations).

6. Select appropriate tools, machines, equipment, materials, and supplies for program objectives.

7. Determine the procedures for developing and maintaining an inventory of tools, machines, equipment, materials, supplies, and records.

10 Knowledge of technology education, professional development, and standards-based instruction and assessment

1. Identify the social, historical, and philosophical foundations of technology education and STEM programs.

2. Apply appropriate instructional and assessment strategies for developing learning activities, including project-based learning, that are aligned with standards (e.g., the Standards for Technological Literacy, Florida Curriculum Frameworks, the Florida Standards).

3. Determine how technology education supports and fosters STEM learning through cross-curricular integration.

4. Apply instructional strategies and measurement instruments for developing and assessing the cognitive learning, psychomotor processes, and problem-solving skills (e.g., critical thinking, lateral problem solving) of diverse student populations.

5. Evaluate the relationships between technology education, career readiness, and career and technical student organizations.

6. Identify components of a lifelong plan for professional and technical development, including learning theories, pedagogical practices, assessment techniques, research findings, and changing technologies.

English
6–12

Section 13

English 6–12

1 Knowledge of effective use of the English language at the postsecondary level

1. Identify and analyze the ways in which the English language has developed over time, including word origins and linguistic, social, religious, historical, and regional influences.

2. Apply standard English grammar, usage, and conventions (i.e., capitalization, punctuation, and spelling) with proficiency.

3. Select and identify various types of sentences (i.e., simple, compound, complex, and compound-complex).

4. Select and determine how to utilize appropriate reference materials to identify the meaning of a word and its pronunciation (e.g., homonyms, homophones), part of speech, synonyms and antonyms, and etymology.

5. Determine connotative and denotative meanings of words and phrases by analyzing context clues and word relationships.

6. Analyze the structure and meaning of words according to their word parts (i.e., prefixes, root words, and suffixes), Greek and Latin roots and affixes, etymology of the English language, and word derivations.

7. Interpret figurative language (e.g., idioms, hyperbole, metaphor, personification, simile).

8. Select and determine appropriate use of academic and domain-specific vocabulary across disciplines.

2 Knowledge and understanding of communication skills, techniques, and processes

1. Determine the structures and purposes of various forms of writing (e.g., narrative, argumentative, expository).

2. Select and apply techniques for writing a personal or fictional narrative (e.g., description, dialogue, foreshadowing) using varied transitions, a clearly established point of view, and an appropriate pace.

3. Select and apply techniques for writing an argument with a logical organizational structure to support claims based on in-depth analyses of topics or texts by utilizing valid reasoning, relevant and credible evidence from sources, and elaboration; and to address counterclaims.

4. Select and apply techniques for writing an expository text that explains and analyzes information from multiple sources by using relevant supporting details, logical organization, varied and purposeful transitions, and a tone that is appropriate to task and audience; and that demonstrates a thorough understanding of the subject.

5. Select and apply evidence-based practices for improving writing by planning, revising, and editing to enhance purpose, clarity, cohesiveness, structure, and style and to address the needs of a specific audience.

6. Select and apply techniques for integrating diverse digital media in written texts and for creating digital presentations that use coherent ideas and a clear perspective.

7. Select and apply strategies for developing and refining a research question; gathering and synthesizing relevant, reliable, and valid information from primary and secondary sources; and paraphrasing and citing sources to avoid plagiarism.

3 Knowledge of literacy processes and instructional practices

1. Select and apply quantitative, qualitative, and student-centered methods for analyzing levels of text complexity and readability.

2. Select and apply effective instructional practices for promoting students' ability to analyze imagery, semantic and syntactic structures, and diction in texts.

3. Select and apply evidence-based practices to enhance students' ability to determine the meaning of words in context according to their word parts, derivations, and etymology, including commonly used foreign words and expressions.

4. Select and apply evidence-based practices to enhance students' ability to construct meaning from texts using context, background knowledge, and personal experiences.

5. Select and apply evidence-based practices to enhance students' ability to evaluate how text structure (e.g., description, problem/solution, chronological, comparison and contrast, cause and effect, sequence) conveys purpose and meaning.

6. Analyze reading performance to determine students' proficiency on the reading continuum (i.e., frustration, instructional, and independent).

7. Select and apply methods of effectively assessing fluency (e.g., scales, rubrics).

8. Select appropriate instructional practices (e.g., collaborative learning, interdisciplinary activities) and technologies to enhance literacy processes.

4 Knowledge of a wide range of literary and informational texts

1. Analyze how key elements of literary texts, including plot, theme, point of view, setting, character, mood, and tone, enhance style and add layers of meaning.

2. Analyze a range of texts across genres by a variety of authors within and across literary periods from classical to present.

3. Analyze the development of universal themes in literary texts from various times and places.

4. Compare and contrast the use or discussion of archetypes in texts and the ways in which authors have adapted mythical, classical, or religious literary texts.

5. Analyze how informational text structures (e.g., description, problem/solution, chronological, comparison and contrast, cause and effect, sequence) convey purpose and meaning.

6. Analyze how informational text features (e.g., table of contents, headings, captions, photographs, graphs, charts, illustrations, glossaries, footnotes, annotations, appendices) convey purpose and meaning.

7. Compare and contrast how authors with differing perspectives address the same or related topics or themes.

8. Evaluate the support used to develop the central idea throughout informational texts, including historical speeches and essays.

9. Evaluate an argumentative text by analyzing an author's reasoning and use of rhetoric and the effectiveness and validity of claims.

10. Compare multiple arguments on a topic by examining how authors use the same information to achieve different purposes.

11. Analyze how authors use literary and rhetorical devices (e.g., figurative language, symbolism, irony, foreshadowing) to create tone and mood, enhance meaning, and achieve purpose in texts across genres.

5 Knowledge of effective techniques for listening, viewing, speaking, and presenting

1. Select and apply appropriate collaborative techniques, active-listening skills, and voice and tone when engaging in academic discussions.

2. Select and apply strategies for presenting information orally with logical organization and coherent focus, emphasizing key points that support the central idea, using credible evidence, and employing rhetorical devices to create a clear perspective.

3. Select techniques for creating digital presentations that use coherent ideas and a clear perspective to enhance the audience's understanding and engagement.

4. Select techniques for using appropriate nonverbal cues, vocal qualities, and pacing to enhance the audience's understanding and engagement.

6 Knowledge of pedagogical content for teaching English language arts

1. Select appropriate evidence-based practices (e.g., collaborative learning, interdisciplinary activities) and technologies (e.g., online collaborative platforms) to develop students' English language skills.

2. Select appropriate instructional practices to guide students in the selection and evaluation of valid and reliable information from primary and secondary sources.

3. Select appropriate instructional practices (e.g., collaborative learning, interdisciplinary activities) and technologies (e.g., online collaborative platforms) to enhance students' writing skills.

4. Select and apply ways to provide meaningful feedback on student writing.

5. Select appropriate instructional practices (e.g., collaborative learning, interdisciplinary activities) and technologies (e.g., online collaborative platforms) to enhance students' comprehension and analysis of texts across genres.

6. Select appropriate instructional practices (e.g., collaborative learning, interdisciplinary activities) and technologies (e.g., online collaborative platforms) to enhance students' listening, viewing, speaking, and presenting skills.

7 Knowledge of various assessments and use of assessment data to drive instructional decisions within English language arts

1. Select and apply a variety of methods for effectively assessing students' English language skills.

2. Select and apply a variety of methods for effectively assessing students' writing skills at each stage of the writing process.

3. Select and apply a variety of methods for effectively assessing students' comprehension and analysis of texts across genres.

4. Select and apply a variety of methods for effectively assessing students' listening, viewing, speaking, and presenting skills.

5. Analyze and evaluate results of formal and informal assessments to determine students' strengths and needs and to adjust instruction accordingly (e.g., differentiation, reteaching, scaffolding, small-group instruction, peer tutoring).

6. Select and analyze appropriate measures for assessing reading performance (i.e., foundational reading skills, vocabulary, and comprehension) and use data to inform instruction.

7. Determine appropriate ways to share assessment data with students and stakeholders.

8 Ability to evaluate a student's written analysis of a literary text

1. Evaluate a student's ability to establish a clear and coherent claim based on an in-depth analysis of a literary text.

2. Evaluate a student's ability to use logical reasoning, elaboration, and relevant textual evidence to support an established claim.

3. Evaluate a student's understanding of the use of literary elements in a given text.

4. Evaluate a student's use of logical organization and purposeful transitions in a written analysis of a literary text.

English for Speakers of Other Languages (ESOL) K–12

Section 47

ESOL K–12

1 Knowledge of culture as a factor in English language learners' (ELLs') learning

1. Analyze elements of culture and their impact on the instruction of ELLs.
2. Identify ways that participation, learning, and behavior can be affected by ELLs' culture (e.g., family, religion, socioeconomic status).
3. Identify phases and distinguish among characteristics of cultural adaptation (e.g., assimilation, acculturation).
4. Select a variety of resources to obtain information about the cultural background and experiences of ELLs and their families to guide curriculum development and instruction.
5. Identify and apply strategies to foster multicultural sensitivity and inclusiveness in the classroom.
6. Identify ways home-school connections build partnerships with ELLs' families.
7. Analyze social issues and trends (e.g., immigration, immigration policies) that may affect ELLs' learning.

2 Knowledge of language as a system

1. Analyze principles of phonology and morphology.
2. Analyze principles of semantics and syntax.
3. Analyze principles of pragmatics and discourse.
4. Identify and apply appropriate forms of the English language for different purposes or contexts (e.g., formal, informal, social, academic).
5. Select a variety of resources to obtain information about the home languages of ELLs.

3 Knowledge of language acquisition and development

1. Identify major theories and processes of first and second language acquisition that inform classroom practices and may affect student learning.
2. Identify characteristics of research-based models of instruction (e.g., dual-language, sheltered).
3. Identify factors that influence the development of bilingualism and biliteracy.

4. Identify how ELLs' literacy and oracy in the home language serve as a foundation for learning English.

5. Determine internal factors (e.g., age, motivation, prior knowledge) and external factors (e.g., social, cultural, political) that may affect ELLs' learning.

6. Distinguish characteristics of social language and academic language.

7. Identify sources of ELLs' errors to guide effective instruction.

8. Identify language functions (e.g., communicating needs, purposes, and desires) of spoken and written English to facilitate English language acquisition.

9. Distinguish between the characteristics of ELLs in the natural process of acquiring English and ELLs with exceptionalities.

10. Identify characteristics of ELLs who are gifted and talented.

4 Knowledge of second language literacy development

1. Determine and apply current theories of second language reading and writing development at varying English proficiency levels.

2. Identify how ELLs' L1 oral language influences the development of English language skills.

3. Identify how ELLs' L1 literacy and home literacy practices influence the development of English language skills.

5 Knowledge of ESL/ESOL research, history, public policy, and current practices

1. Identify past and present approaches to ESOL instruction (e.g., grammar-translation, audio-lingual, TPR, SIOP).

2. Identify major researchers and their influence on best practices in second language and literacy instruction.

3. Evaluate appropriate research-based models of instruction for ELLs.

4. Identify major federal and state court decisions, laws, and policies that have affected the education of ELLs.

5. Apply the sections and requirements of the *League of United Latin American Citizens (LULAC) et al. v. State Board of Education Consent Decree, 1990* (i.e., 1990 Florida Consent Decree, September 2003 Modification to the Consent Decree) to specific situations.

6 Knowledge of standards-based ESOL and content instruction

1. Select standards-based instruction to develop ELLs' English listening and speaking skills for a variety of academic and social purposes.

2. Apply standards-based reading and writing instruction for ELLs at varying English proficiency levels for a variety of academic and social purposes.

3. Select activities, tasks, and assignments that develop authentic uses of English language and literacy to assist ELLs in learning academic language and content.

4. Apply instructional strategies that incorporate ELLs' funds of knowledge to facilitate content area learning.

5. Identify appropriate adaptations of curricular materials and modification of instruction according to an ELL's level of English proficiency and prior knowledge.

7 Knowledge of resources and technologies

1. Evaluate and select culturally responsive, age-appropriate, and linguistically accessible materials, including L1 resources, for ELLs' English language and literacy development.

2. Apply strategies for incorporating technological resources and digital tools, including assistive technology, to enhance language and content area instruction and digital literacy skills for ELLs.

3. Identify effective means of collaboration with school-based, district, and community resources to advocate for equitable access for ELLs.

4. Identify major professional organizations, publications, and resources that support continuing education for teachers of ELLs.

8 Knowledge of planning standards-based instruction of ELLs

1. Apply appropriate language objectives and state-approved content-based standards to plan instruction for ELLs at varying English proficiency levels and prior formal educational backgrounds.

2. Identify characteristics of collaborative, student-centered classroom environments that engage and challenge diverse learners.

3. Choose appropriate methods of differentiation for ELLs' learning, including techniques for scaffolding and providing context, based on English proficiency levels.

9 Knowledge of language proficiency assessments, classroom-based assessments, and assessment issues for ELLs

1. Identify the district, state, and federal requirements for identification, reclassification, and exit of ELLs from ESOL programs.

2. Interpret results from formal and informal assessments to guide instruction for ELLs.

3. Identify effective ways to communicate with stakeholders (e.g., primary caregivers, school and district staff, community members) about assessment outcomes that guide policy and instructional practice.

4. Identify appropriate use of alternative assessments (e.g., authentic, performance based, peer- and self-assessments) and instruments (e.g., checklists, rubrics, anecdotal records) to evaluate ELLs at varying English proficiency levels.

5. Identify appropriate test-taking skills and strategies for formal assessments to support ELLs.

6. Determine appropriate ways to adapt formal and informal assessments according to ELLs' English proficiency levels.

7. Identify factors such as cultural and linguistic bias that affect the reliability and validity of assessments for ELLs.

8. Select formal and informal assessments to measure progress in oral language, literacy, and academic achievement.

9. Identify appropriate accommodations during formal and informal assessments of ELLs.

Exceptional Student Education K–12

Section 61

Exceptional Student Education K–12

1 Knowledge of foundations of exceptional student education

1. Identify state and federal legislation that govern the education of students with exceptionalities.

2. Classify the characteristics of students with exceptionalities using the eligibility criteria of categories included in current state and federal laws and regulations governing K–12 educational programs.

3. Compare typical and atypical development of physical, cognitive, linguistic, social, and emotional stages of students in the K–12 educational system.

4. Interpret principles and practices in the provision of education for students with exceptionalities based on legal and ethical standards.

5. Identify and apply the requirements for developing IEPs, educational plans, and transition IEPs.

6. Evaluate the role and function of systemwide models of support for assisting all students, including students with exceptionalities, in accessing the general education curriculum and achieving high expectations.

7. Apply effective methods of communication, consultation, and collaboration with students, parents or guardians, caregivers, and all other stakeholders as equal members of educational teams.

8. Determine effective methods for coaching and supporting paraprofessionals, tutors, and volunteers to assist students with exceptionalities across settings.

9. Determine the purposes and functions of professionals, advocacy organizations, and agencies relevant to educating students with exceptionalities.

10. Determine the factors associated with disproportionality in exceptional student education.

2 Knowledge of assessment and evaluation

1. Determine the purposes and characteristics of different types of assessments and the appropriate use for students with exceptionalities.

2. Apply the legal requirements and ethical principles regarding assessment of students with exceptionalities.

3. Identify measurement concepts (e.g., reliability, validity), characteristics, and uses of norm-referenced and criterion-referenced assessments for students with exceptionalities.

4. Determine the purposes and requirements for participation of students with disabilities in the statewide assessment program and available accommodations, waivers, and exemptions.

5. Interpret and apply the results of formal and informal assessments to address specific needs of students with exceptionalities.

6. Analyze assessment data to identify student needs and evaluate student progress in acquiring, generalizing, and maintaining skills across settings.

3 Knowledge of instructional practices in exceptional student education

1. Select reliable sources of evidence-based instructional practices and interventions.

2. Apply appropriate instructional approaches, strategies, and materials based on assessments of the student's educational needs (e.g., grade-level standards, academic and functional performance, effect of exceptionality).

3. Choose effective instructional strategies to promote a student's generalization of knowledge and skills across content areas, curriculum, and settings.

4. Identify the characteristics and purposes of the core curriculum, supplemental programs, and intensive interventions as they relate to standards-based English language arts (e.g., Foundations, Reading, Communication, Vocabulary, English Language Arts Expectations) and standards-based mathematics (e.g., Number Sense and Operations, Algebraic Reasoning, Geometric Reasoning, Data Analysis and Probability, Mathematical Thinking and Reasoning) in a multi-tiered system of supports.

5. Apply techniques for differentiating, accommodating, and modifying classroom instruction to meet the educational needs of individual students with exceptionalities.

6. Apply flexible grouping strategies (e.g., academic, behavioral, social) for specific instructional activities with individual students with exceptionalities.

7. Use criteria for selecting and utilizing print and nonprint media for instructional use to match students' needs and interests.

8. Analyze characteristics of specialized instructional approaches for students with significant disabilities.

4 Knowledge of positive behavioral interventions and supports

1. Identify and choose appropriate prevention and intensive intervention strategies for students who display challenging behaviors.

2. Distinguish the various concepts and models of positive behavioral interventions and supports.

3. Analyze the legal and ethical issues pertaining to positive behavioral interventions and supports and disciplinary procedures for students with exceptionalities.

4. Interpret individual and group data to apply interventions that increase positive behavior.

5. Interpret the essential elements of a functional behavior assessment and evaluate the effects of the behavior intervention plan through data collection strategies.

5 Knowledge of multiple literacies and communication skills

1. Identify standards-based language development skills and the components of language structure (e.g., Foundations, Communication, Vocabulary).

2. Distinguish among characteristics of communication disorders and their impact on academic achievement and functional skills.

3. Identify appropriate assistive technology and alternative communication systems to facilitate communication across all educational settings.

4. Determine the sequence of reading development and the critical components of reading proficiency included in the state standards (e.g., Learning and Applying Foundational Reading Skills, Reading, Vocabulary).

5. Apply specialized instructional strategies and techniques to address deficits in phonological processing (e.g., dyslexia, auditory processing disorder) for students with exceptionalities within standards-based English language arts (e.g., Learning and Applying Foundational Reading Skills, Applying Foundational Reading Skills for Secondary Students Needing Reading Interventions), to include evidence-based integrated implementation of interventions and accommodations of these strategies and techniques.

6. Apply evidence-based instructional methods for increasing reading proficiency in phonics, word recognition, and fluency that meet the specific educational and functional needs of individual students with exceptionalities.

7. Apply evidence-based instructional methods for increasing literacy (e.g., oral language, vocabulary, reading comprehension) across content areas that meet the specific educational and functional needs of individual students with exceptionalities, to include evidence-based integrated implementation of interventions and accommodations of these methods.

8. Determine and apply strategies for facilitating students' critical-thinking, executive functioning, and metacognition skills.

9. Select and apply effective instructional methods and supports for teaching writing foundations (e.g., Communicating Through Writing, Following Conventions, Finding Meaning), the writing process, and purposes of writing to meet specific educational and functional needs of individual students with exceptionalities across content areas, to include evidence-based integrated implementation of interventions and accommodations of these methods.

10. Apply evidence-based instructional methods for increasing mathematical skills across content areas that meet the specific educational and functional needs of individual students with exceptionalities, to include evidence-based integrated implementation of interventions and accommodations of these methods

6 Knowledge of the transition process

1. Identify appropriate programs for transition to academic, technical, and career education and development that meet the needs of individual students with exceptionalities.

2. Interpret and apply results of transition assessments to determine appropriate planning strategies to assist students, parents or guardians, caregivers, and stakeholders in developing postsecondary education and career goals for postschool outcomes.

3. Select instructional approaches to assist students with exceptionalities to engage in self-determination and self-advocacy practices.

4. Identify and compare resources and strategies that can assist individual students with exceptionalities to function independently in postsecondary education, home and community living, and employment.

Family and Consumer Science 6–12

Section 52

Family and Consumer Science 6–12

1 Knowledge of families

1. Recognize types and functions of family and household units.
2. Identify cultural influences on family life.
3. Identify stages and characteristics of the family life cycle, including changes in roles and responsibilities during each stage of the cycle.
4. Differentiate the strengths and weaknesses of diverse family structures.
5. Analyze factors that influence the quality of family relationships.
6. Identify effective communication skills.
7. Recognize the needs of and care requirements for elderly family members.

2 Knowledge of personality development

1. Identify hereditary and environmental factors that affect individual growth and development.
2. Recognize theories of personality development.
3. Identify the components of self-esteem and self-concept and strategies for building self-esteem.
4. Analyze factors that contribute to a person's understanding of his or her sexuality.
5. Recognize the influence of gender and its effect on personality development.

3 Knowledge of decision making and problem solving

1. Apply the decision-making process.
2. Analyze the relationship between values, goals, and decision making.
3. Identify joint decision-making skills as applied to families and groups.
4. Identify the steps in conflict resolution.

4 Knowledge of marriage

1. Identify principles and factors, including marriage laws and customs, involved in preparation for marriage.
2. Assess the effects of multiple roles on marital relationships.
3. Determine factors affecting marital relationships.
4. Analyze consequences of divorce and remarriage.

5 Knowledge of preparation for parenthood

1. Identify factors that determine readiness for parenthood.
2. Analyze economic, physical, genetic, and psychological consequences of deciding whether or not to become parents.
3. Identify the process of conception, including functions of the male and female reproductive systems.
4. Evaluate economic, social, and cultural factors as related to family planning.
5. Identify procedures, cost, effectiveness, and side effects of various methods of birth control.
6. Identify alternatives for dealing with infertility.

6 Knowledge of prenatal care, fetal development, and childbirth

1. Identify terms related to pregnancy.
2. Identify factors affecting the development of the fetus.
3. Identify elements of a plan for adequate prenatal care that includes the physical and nutritional needs of the expectant mother.
4. Identify possible complications of pregnancy, including those associated with adolescents and women over age 40.
5. Identify stages of labor and methods of childbirth.
6. Recognize the characteristics of a healthy newborn baby.
7. Identify the aspects of postnatal care for both mother and child.
8. Relate common birth defects to their causes.

7 Knowledge of social, emotional, physical, and intellectual development

1. Identify the stages and characteristics of the physical development and motor control of infants.

2. Identify the stages and characteristics of brain development in infants.

3. Identify the stages and characteristics of social and emotional development of infants.

4. Identify the physical development and motor control of toddlers, including activities appropriate for their developmental levels.

5. Identify the stages and characteristics of cognitive development of toddlers and activities for promoting intellectual development.

6. Identify the stages and characteristics of social and emotional development of toddlers and methods of promoting social and emotional development.

7. Analyze techniques for specific aspects of toddler care, such as feeding, toileting, disciplining, and safety.

8. Identify the stages and characteristics of the physical development and motor control of preschoolers and activities appropriate to their developmental levels.

9. Identify the stages and characteristics of cognitive development of preschoolers and activities for promoting intellectual development.

10. Identify the stages and characteristics of social and emotional development of preschoolers and methods of promoting social and emotional development.

11. Analyze techniques for specific aspects of preschooler care, such as guidance and safety.

12. Identify the stages and characteristics of the physical development and motor control of school-aged children and activities appropriate to their developmental levels.

13. Identify stages and characteristics of cognitive development of school-aged children and activities for promoting intellectual development.

14. Identify the stages and characteristics of the social and emotional development of school-aged children.

15. Assess techniques for the care, guidance, and safety of school-aged children.

16. Recognize the stages and characteristics of the physical, emotional, social, and intellectual development of adolescents.

17. Assess the interpersonal relationships of adolescents, including dating, friendships, and family.

8 Knowledge of parenting

1. Identify various parenting styles and their effects on the growth and development of the child.
2. Differentiate the roles and responsibilities of one- and two-parent families.
3. Identify characteristics of a quality childcare facility.
4. Identify communication patterns that affect parent-child relationships.
5. Analyze techniques promoting social competence in children.
6. Identify appropriate methods of recognizing and working with children who have special needs.

9 Knowledge of stress and crises

1. Identify types of family crises brought about by events such as birth, aging, long-term illness, and death.
2. Interpret consequences of various crises.
3. Recognize coping skills in dealing with crises.
4. Identify causes and consequences of substance abuse.
5. Recognize types and causes of family violence.
6. Identify signs of suicidal behavior and preventative techniques.
7. Identify support systems and agencies for crisis assistance.
8. Apply stress management techniques.

10 Knowledge of clothing selection

1. Identify cultural, social, and economic factors that influence the selection of clothing.
2. Apply the principles of design to garment and textile selection.
3. Analyze the psychological effects of color, design, and other factors on the selection of clothing and accessories.

11 Knowledge of clothing, textiles, and technology

1. Evaluate properties and characteristics of textiles in relation to use and care.
2. Identify the effects of different types of fibers, yarns, construction, and finishes on fabrics.
3. Interpret labels on clothing and textile products.
4. Identify federal laws regarding clothing and textile products.
5. Identify guidelines for the selection, use, and care of sewing equipment.
6. Identify factors to consider when selecting patterns and fabrics.
7. Analyze techniques of pattern alteration, fabric preparation, layout, cutting, marking, construction, and pressing compatible with fabric and garment design.
8. Assess methods for care, repair, and storage of garments.
9. Evaluate garments according to standards of construction.

12 Knowledge of the American economic system

1. Analyze the American economic system as it relates to the consumer.
2. Identify factors that influence pricing, including the costs of production, distribution, and selling of goods and services.
3. Identify the purposes and sources of taxation.

13 Knowledge of money and resource management

1. Identify the elements of budgeting, including factors in estimating income and expenses.
2. Identify sources and procedures for establishing, using, and protecting credit.
3. Compare services provided by financial institutions.
4. Identify types of insurance coverage, benefits, and retirement programs.
5. Identify resource management principles, techniques, and processes appropriate to various stages of the life cycle.
6. Analyze the use of computers in money and resource management.

14 Knowledge of consumerism

1. Compare consumer purchasing practices for stores, catalogs, multimedia, and the Internet.
2. Evaluate products according to quality standards.
3. Identify sources of consumer information.
4. Identify guidelines for consumer shopping.
5. Identify consumer rights and responsibilities, including ecological practices.
6. Identify laws, issues, and regulations protecting the consumer.
7. Identify issues resulting from increased technology.

15 Knowledge of factors affecting housing selection

1. Analyze trends in housing affected by needs and desires of the population.
2. Identify government regulations that influence housing.
3. Identify characteristics of various types of housing.
4. Analyze factors affecting housing selections.
5. Define basic terms of standard lease and mortgage sales contracts.
6. Compare renting and buying.
7. Analyze the cost of providing for housing needs.

16 Knowledge of home design features

1. Evaluate home construction features in terms of traffic patterns, room arrangements, storage facilities, kitchen work areas, and the impact of the family life cycle.
2. Analyze home energy usage and methods for conserving energy.
3. Evaluate home construction features in terms of maintenance, repair, aesthetics and family needs.
4. Analyze interior spaces using the basic elements and principles of design.
5. Identify factors in the selection of appropriate wall, window, and floor treatments.
6. Evaluate room arrangements for efficient and effective use of furniture, architectural features, traffic paths, and focal points.

7. Select furniture styles according to design, scale, proportion, and family needs.

8. Evaluate home furnishings according to materials, workmanship, care, and family needs.

9. Identify the use of emerging technology in home design.

17 Knowledge of nutrition and wellness

1. Analyze the relationship of diet, exercise, and wellness.

2. Analyze nutritional information based on the *Food Guide Pyramid* and the *Dietary Guidelines for Americans*.

3. Identify the nutrients, their primary functions, and major food sources.

4. Compare effects of age, gender, physical activity, and stress on nutritional needs.

5. Select appropriate diets for infants, young children, the middle-aged, the elderly, pregnant women, athletes, and individuals with special health problems.

6. Identify eating disorders and their effects on mental and physical health.

7. Identify nutritional deficiencies and excesses and symptoms of each.

8. Analyze the effect of addictive behaviors (e.g., smoking, alcohol, drugs) on diet and wellness.

18 Knowledge of meal planning and service

1. Analyze influences of life cycle, multicultural, socioeconomic, and geographic factors on food choices.

2. Identify factors contributing to aesthetically pleasing meals.

3. Apply the principles of the *Food Guide Pyramid* and the *Dietary Guidelines for Americans* to meal planning.

4. Analyze budget and management factors to consider in planning the purchase and preparation of food.

5. Determine appropriate table settings and table services.

6. Identify appropriate mealtime etiquette.

19 Knowledge of principles of food selection, safety, and storage

1. Evaluate food items using the food labeling system.
2. Interpret information conveyed in unit pricing and dating of products.
3. Identify government grades and policies as set by the U.S. Department of Agriculture (USDA), the Food and Drug Administration (FDA), and other recognized agencies.
4. Identify safety and sanitation procedures in the production, processing, handling, and storage of food.
5. Identify safety and sanitation procedures in the use of food preparation utensils and equipment.
6. Identify various food-borne illnesses and their causes.
7. Evaluate food quality in terms of product standards.
8. Identify technology used to preserve, alter, or enhance food products.
9. Analyze the effects of physical processes (such as heating, cooling, dehydrating, and crystallizing) and storage on food quality.
10. Identify the purposes, functions, and physiological effects of food additives.

20 Knowledge of food preparation

1. Identify principles to consider in selection, use, and care of kitchen utensils and equipment in the home and workplace.
2. Recognize principles of organization and management in the arrangement and use of kitchen facilities and equipment.
3. Relate the physical and chemical composition of food to food preparation techniques.
4. Analyze variations in quality of finished food products.
5. Identify terms, techniques, and preparation tasks for food preparation.
6. Identify the use of emerging technology in food preparation.
7. Identify food preparation techniques for each group in the *Food Guide Pyramid*.

21 Knowledge of the profession

1. Identify the integrative nature of the Home Economics field and how the areas of specialization fit together.

2. Identify career opportunities and determine effective job search strategies, such as writing résumés, writing cover letters, and interviewing.

3. Identify exploratory, practical arts, and job-preparatory courses/programs.

4. Demonstrate knowledge of national vocational legislation that has affected the development of Home Economics.

5. Recognize the significance of ethics, public policy, and cultural and global diversity for the Home Economics professional.

6. Identify student organizations and strategies for including their activities in the curriculum.

7. Identify professional organizations, journals, and publications for Home Economics.

French
K–12

Section 15

French K–12

1 Knowledge of communication (performance)

1. Demonstrate proficiency in speaking French by orally responding to a speaker, providing and requesting information, and expressing feelings, emotions, and opinions.

2. Demonstrate proficiency in speaking French by orally presenting cultural information, concepts, and ideas on a variety of topics.

3. Demonstrate proficiency in writing French by presenting, in a written form, concepts, ideas, opinions, and cultural information on a variety of topics.

2 Knowledge of communication

1. Demonstrate proficiency in listening by understanding and interpreting spoken French (e.g., political speech, radio interview, conversation, recitation, lecture) on a variety of topics.

2. Demonstrate proficiency in reading by understanding and interpreting written French on a variety of topics.

3 Knowledge of cultures

1. Identify elements of contemporary cultures in the Francophone world.

2. Identify major figures and ideas and their significance in the visual and performing arts, literature, and music of the Francophone world.

3. Identify major historical, geographic, social, governmental, and economic features of Francophone societies.

4. Identify various viewpoints related to other disciplines as expressed in Francophone media.

4 Knowledge of sociolinguistic patterns through comparisons of English and French

1. Identify various sociolinguistic patterns.

2. Identify cultural differences or similarities in language usage.

5 Knowledge of linguistic patterns

1. Identify the meaning of idioms, cognates, word roots, and derivatives.

2. Identify linguistic features (e.g., spelling, capitalization, punctuation, accent marks).

3. Identify the correct use of linguistic structures.

6 Knowledge of pedagogy

1. Select appropriate methods and materials for teaching listening to, speaking, reading, and writing French.

2. Select appropriate assessment instruments to evaluate proficiency in listening to, speaking, reading, and writing French.

3. Select appropriate methods for teaching the cultures of the Francophone world.

4. Select appropriate assessment instruments to evaluate knowledge of Francophone cultures.

5. Select appropriate strategies and materials for teaching the French language and the literatures and cultures of the Francophone world to diverse populations with a wide range of learning styles and abilities.

6. Select appropriate assessment instruments to evaluate knowledge of the French language and the literatures and cultures of the Francophone world taught to diverse populations with a wide range of learning styles and abilities.

7. Select appropriate strategies for incorporating technology in teaching the French language and the literatures and cultures of the Francophone world.

German
K–12

Section 17

German K–12

1 Ability to converse in German at an intermediate-high level (Speaking)

1. Converse on topics of general interest and daily routine, so that errors in pronunciation and structures do not impede successful communication.

2 Comprehension at an advanced level of spoken German passages on topics of general interest

1. Identify the main idea of a spoken passage or an appropriate summary of a spoken passage.
2. Identify details pertinent to the main idea of a spoken passage.
3. Identify the best response to a question or statement based on a spoken passage.
4. Identify and interpret basic sentence and intonation patterns.

3 Ability to write German at an intermediate-high level on topics of general interest and/or dealing with daily routine

1. Write short passages that express personal preferences, needs, and observations, so that errors in orthography and structure do not impede communication.

4 Ability to read at an advanced level German passages on a variety of personal, social, and general topics

1. Identify the main idea or an appropriate summary of a written passage.
2. Identify details pertinent to the main idea of a written passage.
3. Identify the best response to a question or statement based on a written passage.

5 Knowledge of German vocabulary in areas of general interest and application of vocabulary skills

1. Apply context clues to define words.
2. Apply dictionary skills.
3. Choose the most appropriate translation.

6 Knowledge of German grammar and syntax in context

1. Decline German nouns in singular and plural forms in the nominative, accusative, dative, and genitive cases in context.

2. Identify and analyze determiners in nominative, accusative, dative, and genitive cases in context.

3. Identify and analyze often-used adjectives and adverbs, adjective endings, and comparative and superlative forms in context.

4. Identify and analyze often-used prepositions, da- and wo- compounds, and idiomatic prepositional phrases, including prepositional verb combinations.

5. Identify and analyze often-used verbs in the present, future, simple past, and present/past perfect tenses in context.

6. Identify and analyze often-used modal auxiliary verb structures in context.

7. Identify and analyze often-used dative verbs in context.

8. Identify and analyze often-used subjunctive structures in context.

9. Identify and analyze often-used reflexive verbs and reflexive pronouns in context.

10. Identify and analyze often-used passive voice constructions and common alternative forms in context.

11. Identify and analyze often-used verbs with prefixes in context.

12. Identify and analyze personal and relative pronouns in context.

13. Identify and analyze the use of the infinitive in context.

14. Identify and analyze imperative forms in context.

15. Identify and analyze interrogative constructions in context.

16. Identify and analyze negative constructions in context.

17. Identify and analyze word order in context.

18. Identify and analyze often-used coordinating and subordinating conjunctions in context.

7 Knowledge of the culture, social customs, and daily life of German-speaking countries

1. Identify well-known features of daily life and contemporary culture, including internationally known personalities, in German-speaking countries.

2. Identify social customs in German-speaking countries.

3. Identify governmental, educational, religious, and economic institutions of German-speaking countries.

4. Identify cultural differences and similarities between the United States and German-speaking countries.

5. Recognize elements in American culture and language that originated in German-speaking countries or that were introduced by immigrants from German-speaking countries.

6. Identify famous native speakers of German and their contributions to the culture of the United States.

7. Identify and recognize diversity in the target culture.

8 Knowledge of history and geography of German-speaking countries

1. Identify major historic events and well-known historic figures.

2. Identify major geographic features of German-speaking countries and well-known products, industries, and exports of German-speaking countries.

9 Knowledge of arts and sciences in German-speaking countries

1. Identify major writers, composers, and artists (e.g., Schiller, Goethe, Bertolt Brecht, Mozart, Wagner, Dürer, Otto Dix).

2. Identify major legendary and fictional characters (e.g., Faust, Siegfried, Max and Moritz, Wilhelm Tell).

3. Identify major philosophers, scientists, and inventors (e.g., Kant, Hegel, Roentgen, Einstein, Benz, Gutenberg).

10 Pedagogy and professional knowledge

1. Identify various foreign language teaching methodologies and strategies appropriate to the four skill areas of speaking, listening, reading, and writing.

2. Identify evolving aspects of foreign language instruction, proficiency-based curriculum, and communicative competence.

3. Identify state and national professional organizations and the services that are available to teachers of German from professional organizations and agencies of German-speaking countries (e.g., AATG, FATG, FASG, Goethe Institute).

4. Demonstrate knowledge of print media, broadcasts, and German Web sites.

5. Identify the role of foreign languages in an integrated curriculum.

Health
K–12

Section 19

Health K–12

1 Knowledge of the foundation, theories, and principles of health education

1. Identify the philosophies, theories, and models of comprehensive health education.
2. Distinguish between the stages of prevention and intervention along continua of care.
3. Identify and apply the individual components of effective coordinated school health programs.
4. Identify and apply policies and legislation impacting school health education and services.
5. Demonstrate cultural competency within the analysis of foundations, theories, and principles of health education.

2 Knowledge of health education standards and health literacy

1. Demonstrate an understanding of health literacy.
2. Identify and apply state and national health standards for health education.

3 Knowledge of health education instructional practices

1. Identify and compare tools and techniques for assessing the health needs of individuals, schools, and communities.
2. Identify and apply instructional strategies to meet the needs of diverse populations.
3. Identify effective health education program planning.
4. Select and apply effective implementation strategies for health education programs.
5. Identify methods for evaluating health education programs.
6. Identify health education resources and health practitioners.
7. Identify effective techniques to communicate health information to appropriate audiences.
8. Identify methods, tools, and strategies for assessing students' progress toward health literacy.

4 Knowledge of personal health behaviors and wellness

1. Interpret and analyze concepts and components of wellness.
2. Evaluate the benefits and consequences of personal health practices.

3. Evaluate goal-setting strategies used for personal health and wellness.

4. Evaluate decision-making strategies used for personal health and wellness.

5 Knowledge of human anatomy and physiology

1. Demonstrate knowledge of the structures and interrelated functions of human body systems.

2. Identify the relationships of anatomy and physiology to health.

3. Identify physiological changes to the human body throughout the life cycle (e.g., conception to death).

4. Identify physiological adaptations as a result of physical activity, rest, and sleep.

6 Knowledge of pathology and prevention of human diseases and disorders

1. Identify causes, modes of transmission, risk factors, symptoms, treatments, and prevention of communicable diseases.

2. Identify causes, risk factors, symptoms, treatments, and prevention of noncommunicable diseases and disorders affecting the body.

3. Identify and determine common screenings and diagnostic techniques for prevention or early intervention benefits.

7 Knowledge of interpersonal health

1. Analyze relationships among families, peers, culture, media, and technology regarding interpersonal health behaviors.

2. Identify and interpret the influence of changing roles, relationships, and socioeconomic factors on interpersonal health.

3. Identify and demonstrate an understanding of the effective use of coping skills.

4. Define and demonstrate an understanding of the effective use of interpersonal communication skills.

5. Identify effective community resources that support and assist in healthy social development.

8 Knowledge of sexual health

1. Identify key characteristics of sexual development (e.g., infancy, childhood, adolescence, adulthood).

2. Determine age- and developmentally-appropriate relationship skills throughout life (e.g., friend relationships, dating relationships, intimate relationships; healthy relationships, unhealthy/abusive relationships).

3. Identify effective research-based strategies for preventing pregnancy.

4. Identify effective research-based strategies for preventing STIs, including HIV.

9 Knowledge of nutrition and physical fitness

1. Identify basic nutrients, food guides, and serving size recommendations.

2. Analyze the impact of culture on nutrition and exercise.

3. Describe the relationships between daily food intake, body weight, and physical activity.

4. Identify the signs, symptoms, and risk factors associated with eating disorders and obesity.

5. Analyze the benefits of regular physical activity and proper nutrition.

6. Explain the principles of exercise prescription and fitness assessment.

10 Knowledge of mental and emotional health

1. Identify characteristics of positive mental health and emotional intelligence.

2. Identify mental and emotional health risk factors.

3. Identify common signs and symptoms of mental and emotional health disorders requiring referral (e.g., self-harming behaviors, suicidal ideation).

4. Evaluate the impact of mental health disorders on the individual, family, peers, and community.

5. Identify strategies for prevention and intervention of mental and emotional health disorders.

6. Identify the psychosocial and physiological effects of stress.

7. Apply appropriate and effective strategies for stress management.

8. Identify community and other resources that support and assist healthy mental and emotional development.

11 Knowledge of substance use, abuse, and dependency and addictive behaviors

1. Identify risk factors contributing to substance use, abuse, and dependency and addictive behaviors.

2. Identify protective factors contributing to the prevention of substance use, abuse, and dependency and addictive behaviors.

3. Recognize signs and symptoms of possible substance use, abuse, and dependency and addictive behaviors.

4. Identify the effects of substance use, abuse, and dependency and addictive behaviors on all domains (i.e., individual, peer, school, family, community).

5. Recognize socioeconomic and legal consequences of substance use, abuse, and dependency and addictive behaviors.

6. Identify research-based resources and strategies for prevention, intervention, and treatment of substance use, abuse, and dependency and addictive behaviors.

7. Explain the physiological and psychological effects of alcohol, tobacco, drugs, and other substances of abuse.

12 Knowledge of violence prevention and intervention

1. Identify types and characteristics of violence.

2. Determine and assess factors contributing to violent or abusive behaviors.

3. Differentiate among the characteristics of bullies, victims, and bystanders.

4. Evaluate the effects of bullying, harassment, and hazing.

5. Identify effective school- and community-based strategies for the prevention and intervention of violent or abusive behaviors among youth.

6. Identify relationships between the use of technology and violent or abusive behaviors.

13 Knowledge of consumer health-related practices and media literacy

1. Identify criteria and resources for evaluating health information, products, practices, and services.

2. Compare the relationship between consumer health laws and practices.

3. Identify emerging and holistic health practices and complementary alternative medicine.

4. Apply strategies for evaluating media-based health information.

5. Identify types of media and technology strategies used to influence individual health decisions and community health.

6. Differentiate strategies for accessing valid health education information, products, and services to enhance health.

14 Knowledge of community health

1. Interpret existing data to determine a community's level of risk and protection.

2. Analyze how perceptions of norms influence risk-taking and health-enhancing behaviors in a community.

3. Determine variables that influence the culture and climate of communities.

4. Determine the accessibility and effectiveness of community resources to address a variety of community health needs.

5. Evaluate how public health policies and government regulations influence community health.

6. Analyze the relationships between community health data and policy decisions.

7. Identify advocacy strategies for personal, family, and community health.

15 Knowledge of environmental health

1. Explain interrelationships between human behavior and the environment.

2. Relate how environmental hazards impact individuals and communities.

3. Determine ways individuals and the community assume responsibility for developing and maintaining environmental quality.

4. Identify effective strategies to improve environmental quality.

16 Knowledge of unintentional injury and safety practices

1. Identify effective safety practices used in schools, home, community, and recreational settings.

2. Identify leading causes of unintentional injuries among children, adolescents, and adults.

3. Identify first aid techniques and procedures, including the use of CPR and an AED.

4. Identify crisis and emergency management procedures (e.g., hurricane preparedness, fire safety planning, water emergency response).

Humanities
K–12

Section 22

Humanities K–12

1 Knowledge of the vocabulary and concepts basic to the humanities

1. Identify basic vocabulary used in discussing the arts.
2. Identify organizational principles of the arts.
3. Identify characteristics of various genres of musical, visual, literary, and performing arts.

2 Knowledge of historical periods, styles, and movements

1. Identify major periods of Western culture.
2. Identify significant artists and characteristics of major art forms and principal genres throughout the different periods of Western culture.
3. Identify prominent philosophers and philosophical ideas throughout the different periods of Western culture.
4. Identify prominent political and economic systems of the major periods of Western culture.
5. Identify significant Egyptian, Greek, Roman, and Byzantine contributions to, and influences on, Western culture.
6. Identify significant Jewish, Christian, and Muslim contributions to, and influences on, Western culture.
7. Identify significant African, Asian, Latin American, and indigenous American contributions to, and influences on, Western culture.
8. Identify the influences of geography and historical events on the arts.

3 Knowledge of the interrelatedness of arts and ideas

1. Identify works of art with common themes, symbols, or motifs.
2. Identify the influence of one artistic work, artist, or group of artists on another.
3. Relate a major concept or idea to a representative work or person.
4. Identify the influences popular and fine art forms have on each other.
5. Identify the effects of scientific discoveries and technological advances on the arts.

4 Knowledge of the relationship between a culture's beliefs and values and their expression in the humanities

1. Identify major works of art that influence a culture.
2. Identify themes, symbols, and motifs that recur over time and across cultures.
3. Identify ways in which different cultures portray and express historical and religious events.
4. Identify the philosophical and religious influences found in significant artistic works.
5. Identify the influences of political, social, or religious institutions on artistic expression.
6. Identify ways in which gender roles are reflected in the arts.
7. Relate artistic styles and techniques to the beliefs and values of different cultures.

5 Knowledge of prominent aesthetic principles used by major cultures in evaluating the arts

1. Identify ways in which different aesthetic principles are manifested in significant works of musical, visual, literary, and performing art.
2. Discriminate among aesthetic principles of different eras and cultures.

6 Knowledge of instructional techniques, assessment, and resources appropriate to the humanities

1. Identify effective methods of presenting humanities topics.
2. Identify effective teaching strategies for diverse student populations in humanities classes.
3. Identify appropriate evaluation methods for assessing and measuring student progress in humanities classes.
4. Identify appropriate and effective academic, community, and technological resources for teaching the humanities.

Latin
K–12

Section 24

Latin K–12

1 Knowledge of English words derived from Latin vocabulary

1. Use knowledge of prefixes and suffixes of Latin origin to partially decode the meanings of English words.

2. Use Latin roots to determine meanings of English words.

2 Knowledge of Latin vocabulary in a given context

1. Select the most appropriate English meaning for a Latin word, phrase, or idiom in a given context.

2. Choose the most appropriate Latin word, phrase, or idiom in a given context.

3 Knowledge of the grammatical forms of Latin words

1. Apply the rules for the formation of regular nouns and pronouns (e.g., personal, demonstrative, relative, interrogative): the nominative, genitive, dative, accusative, ablative, and vocative forms of nouns; and the nominative, genitive, dative, accusative, and ablative forms of pronouns.

2. Apply the rules for the formation of regular adjectives and adverbs: the nominative, genitive dative, accusative, ablative, and vocative forms of adjectives in the positive, comparative, and superlative degrees; and the forms of adverbs in the positive, comparative, and superlative degrees.

3. Apply the rules for the formation of regular verbs: the person, number, tense, and voice of verbs in the indicative and subjunctive moods; and the present active positive imperative mood of verbs.

4. Apply knowledge of irregular verb forms (e.g., *sum*, *eo*, *fero*, *volo*): the person, number, tense, and voice of verbs in the indicative and subjunctive moods; and the present active positive imperative mood of verbs, including the irregular forms of *dico*, *duco*, *fero*, and *facio*.

5. Apply the rules for the formation of verbals: the tense and voice of the infinitive (with the exception of the future passive) and the tense, voice, and case of participles.

4 Understanding of grammatical constructions in a given context

1. Identify the appropriate use of nouns in the following cases: the nominative case (e.g., subject and predicate noun); the genitive case (e.g., possessive, partitive); the dative case (e.g., indirect object, with certain adjectives); the accusative case (e.g., direct object, extent of space and time, with certain prepositions, subject of infinitive); the ablative case (e.g., place from which, place where, personal agent, accompaniment, manner, means, time, comparison, separation, degree of difference); and the vocative case.

2. Determine the appropriate use of pronouns (e.g., personal, demonstrative, relative, interrogative).

3. Determine the appropriate use of adjectives (e.g., as modifiers, as predicate adjectives, as nouns or substantives).

4. Distinguish the appropriate use of mood in independent and subordinate clauses: the indicative, subjunctive, and imperative moods in an independent clause; and the indicative and subjunctive moods in dependent (subordinate) clauses (e.g., indicative in relative clauses and subjunctive in purpose, result, indirect command, indirect question, *cum* clauses).

5. Identify the appropriate use of verbals: the complementary infinitive, the structure of the indirect statement, participles and participial phrases (e.g., ablative absolute, active and passive periphrastics, gerunds and gerundives, supines).

5 Knowledge of pedagogical methods, reference materials, and teaching aids appropriate to the Latin classroom

1. Select appropriate methods for teaching derivation and vocabulary.

2. Select appropriate methods for analyzing the structure of Latin in a given situation.

3. Select appropriate methods for teaching reading comprehension and analysis.

4. Select appropriate reference materials and instructional aids for teaching mythology and political, social, and literary history.

6 Ability to read and understand passages of connected Latin prose at the level of difficulty of straightforward narrative passages in *Caesar's Gallic Wars, Book 1*, or the *De Illustribus Viris* of Cornelius Nepos and poetry at the level of difficulty of Vergil's *Aeneid* or Ovid's *Metamorphoses*

1. Identify a main idea in a given passage of prose or poetry.

2. Identify facts and opinions in a given passage of prose or poetry.

3. Identify a historical, literary, or mythical reference in a given passage of prose or poetry.

7 Ability to identify meter in Latin poetry and basic literary devices in Latin prose or poetry

1. Identify metric patterns within a line of dactylic hexameter.

2. Identify basic literary devices (e.g., anaphora, antithesis, asyndeton, chiasmus, litotes, parallelism) in a given passage of Latin prose or poetry.

8 Knowledge of classical mythology

1. Identify the functions and attributes of the major Greek and Roman deities.

2. Identify major stories and historical events connected with the prominent mythological figures.

9 Knowledge of Roman literary history

1. Identify authors of the Republic (i.e., Plautus, Terence, Cicero, Caesar, Catullus, Lucretius) by genre and major works.

2. Identify major authors of the early Empire (i.e., Vergil, Horace, Ovid, Livy, Pliny the Younger) by genre and major works.

10 Knowledge of Roman political history

1. Identify the names and dates of the three major periods of Roman history: Monarchy (753-509 BCE), Republic (509-27 BCE), and Empire (27 BCE-CE 476).

2. Identify events and biographical information associated with major characters of the Roman Monarchy (i.e., Romulus through Tarquinius Superbus).

3. Identify events and biographical information associated with major characters of the Roman Republic (e.g., Cincinnatus, Hannibal, the Gracchi, Marius, Sulla, Pompey, Crassus, Caesar, Cicero, Cleopatra, Antony).

4. Identify events and biographical information associated with major characters of the Roman Empire (e.g., the Julio-Claudian emperors, Vespasian, Hadrian, Marcus Aurelius, Diocletian, Constantine).

11 Knowledge of Roman social history

1. Identify major geographical locations in Italy, Gaul, Greece (Athens), Asia Minor (Troy), and North Africa (Carthage).

2. Identify the parts of a Roman name.

3. Identify the titles and primary duties of major Roman governmental officials.

4. Identify terms used for the major parts of a Roman house and basic articles of Roman clothing.

5. Apply the rules for the formation of Roman numerals.

6. Identify the sequence of chronological dates (i.e., BCE, CE).

12 Knowledge of Roman contributions to Western civilization

1. Identify contributions of Latin literature to Western literary tradition.

2. Recognize contributions of Roman civilization to Western art, architecture, and engineering.

3. Identify contributions of Roman civilization to modern law, government, and science.

4. Identify contributions of the Latin language to the Romance languages.

5. Identify Latin mottoes, abbreviations, and expressions currently in use in the English language.

Marketing
6–12

Section 57

Marketing 6–12

1 Knowledge of marketing careers and employability

1. Identify the resources for marketing career research, including educational and personal requirements, job descriptions, and career ladders.

2. Identify methods for finding job leads and securing information about marketing positions, including technology (e.g., Internet applications).

3. Identify correctly prepared job applications, cover letters, and resumes in print and electronic formats.

4. Identify successful job interview and follow-up techniques.

5. Identify acceptable work habits.

2 Knowledge of human relations

1. Demonstrate knowledge of the concepts of self-understanding, self-esteem, and human relations.

2. Demonstrate knowledge of personal goal setting and time management principles.

3. Identify interpersonal skills necessary to foster positive working relationships.

4. Identify positive customer/client relations and methods of handling difficult customers, customer inquiries, and complaints.

5. Identify ethical and unethical business practices in the work environment.

6. Identify issues relating to sexual harassment in the workplace.

7. Identify appropriate behaviors related to diversity in the workplace (e.g., people of different cultures, people with special needs).

3 Knowledge of communications

1. Identify principles of verbal and nonverbal communications (e.g., speaking, writing, listening, reading, body language).

2. Apply knowledge of printed and electronic business letters, business reports, and inter-departmental and company communications.

3. Identify appropriate procedures for using communication technologies in a professional manner (e.g., proper etiquette, legal considerations, ethical considerations).

4. Demonstrate knowledge of the nature and importance of employee communications (e.g., employee publications, staff meetings, e-mail, Web sites, intranet).

5. Identify modern communications technology and its impact on the field of marketing.

4 Knowledge of marketing mathematics

1. Analyze information in charts and graphs.

2. Solve sales transaction problems involving cash, charge, layaway, COD, returns, and discounts.

3. Perform marketing calculations, such as stock turnover, net sales, stock-sales ratio, mark-ups, markdowns, planned purchases, inventory overages and shortages, and open-to-buy.

4. Calculate purchase order and invoice totals and terms.

5. Analyze profit and loss statements.

6. Identify simple and compound interest.

7. Calculate break-even points.

5 Knowledge of economic principles

1. Identify economics terminology and economic activities.

2. Identify economic goods, services, and resources.

3. Identify the five types of economic utility (e.g., form, place, possession, time, information).

4. Analyze the concept of supply and demand.

5. Identify the characteristics of the different types of economic systems and how each system answers the three basic economic questions.

6. Identify the roles of profit, risk, competition, and productivity in a free enterprise system.

7. Analyze the relationship between government and business.

8. Analyze the relationship between organized labor and business.

9. Identify the components of the Gross Domestic Product and Gross National Product.

10. Analyze the phases and characteristics of business cycles.

11. Demonstrate knowledge of the issues involved in international trade (e.g., terminology, case situations, legal ramifications).

12. Identify the components of Consumer Price Index and how those components are measured.

6 Knowledge of marketing principles

1. Identify marketing functions and related activities.

2. Identify and analyze marketing strategies.

3. Apply knowledge of the concept of market and market identification to business situations.

4. Identify the characteristics and functions of channels of distribution (e.g., industrial, consumer, direct, indirect, integrated).

5. Identify pricing concepts and the factors affecting selling price.

6. Identify the principles of product/service planning and the stages of the product life cycle.

7. Identify factors of a business image.

8. Demonstrate knowledge of components of a marketing mix for online and physical store locations or both (i.e., click businesses, brick-and-mortar businesses, brick-and-click businesses).

7 Knowledge of selling

1. Demonstrate knowledge of the steps of the selling process: opening, questioning, substitution, demonstration, handling objections, closing, suggestion selling, and follow-up.

2. Identify key factors in building a clientele and maintaining a customer and prospect list.

3. Identify customers' buying motives.

4. Identify the process of feature and benefit selling.

5. Identify the purpose of sales quotas, sales journals, sales training, and sales-incentive programs.

6. Demonstrate knowledge of sales via Internet marketing.

7. Identify the types and roles of nonpersonal and personal sales.

8 Knowledge of business operations

1. Identify the fundamentals of store security, safety, and maintenance.
2. Identify the steps of the shipping and receiving processes.
3. Identify the fundamentals of inventory control and recognize inventory variances.
4. Identify the fundamentals of credit and the factors involved in granting consumer credit.
5. Identify the types of business risks and the methods of risk management.
6. Demonstrate knowledge of and the role of outsourcing.
7. Analyze the different types of investments where business cash reserves can be placed.

9 Knowledge of sales promotion

1. Demonstrate knowledge of the elements of the promotional mix and its components (e.g., public relations/publicity, display, personal selling, sales promotion, advertising).
2. Demonstrate knowledge of the factors involved in planning promotional programs.
3. Identify the role of the advertising agency.
4. Identify the types of advertising media and calculate their costs.
5. Identify the factors used in the selection and evaluation of advertising media.
6. Identify the parts of a printed advertisement.
7. Identify similarities and differences between promotional and institutional advertising.

10 Knowledge of product and service technology

1. Identify sources of product and/or service information.
2. Identify grades, standards, warranties, and guarantees.
3. Identify the roles of trade journals/periodicals, professional/trade organizations, trade shows, dealer/franchise meetings, and online resources.

11 Knowledge of leadership and management

1. Identify leadership or management styles (e.g., authoritarian, laissez-faire, democratic).
2. Demonstrate knowledge of human resources development functions, such as motivation, training, and evaluation.

3. Identify factors involved in employee wages, fringe benefits, and incentive programs.

4. Identify operating budget procedures.

5. Identify management's role in customer relations.

6. Identify computer applications in marketing: inventory, merchandising, data entry, and spreadsheets for decision making.

7. Identify the functions of management (e.g., planning, organizing, directing, controlling).

12 Knowledge of work-based experiences

1. Identify how to develop business partners and promote work-based programs (e.g., mentoring, career shadowing, internships, cooperative work experience).

2. Identify student placement procedures: training stations, training plans, and evaluating students.

3. Demonstrate knowledge of the child labor laws.

4. Identify strategies to recruit and place student learners.

5. Demonstrate knowledge of industry certifications (e.g., IC3, MOUS, 440 Customer Service Representative).

13 Knowledge of program operation

1. Identify the purposes and functions of a marketing education advisory committee.

2. Identify professional publications and organizations (e.g., *Techniques*, *Dimensions*, *Florida Trend*, *Wall Street Journal;* Florida Association of Marketing Educators [FAME], Florida Association of Career and Technical Educators [FACTE], Marketing Education Association [MEA], Association of Career and Technical Educators [ACTE], National Career Academy Coalition [NCAC]).

3. Identify current trends and terminology in marketing education.

4. Demonstrate knowledge of the purpose, operations, and goals of career student organizations (e.g., DECA: An Association of Marketing Students).

14 Knowledge of entrepreneurship

1. Recognize the elements of entrepreneurship.

2. Identify personal characteristics necessary to be a successful entrepreneur.

3. Identify the components of a plan for opening a business (e.g., form of ownership, financing, merchandising, promotion).

4. Demonstrate knowledge of the different types of business ownership.

5. Differentiate between the terms used in entrepreneurial endeavors (e.g., franchise, franchisee, franchisor, sole-proprietorship, limited liability, partnership, nonprofit, corporation).

15 Knowledge of financial literacy

1. Identify steps to balance a checkbook.

2. Identify different savings options (e.g., savings account, money market, certificate of deposit).

3. Identify differences between banks and credit unions.

4. Identify personal investment options (e.g., stocks, bonds, mutual funds, real estate, collectibles).

Mathematics
6–12

Section 26

Mathematics 6–12

1 Knowledge of number sense, operations, and proportionality

1. Compare and convert between rational numbers represented in various ways (i.e., fractions, terminating and repeating decimals, percentages, number line).

2. Solve problems by performing operations with rational numbers, using estimates and algorithms, and evaluate multi-step expressions using order of operations (e.g., expressions with rational exponents, multiple levels of grouping symbols, radicals, absolute value).

3. Estimate irrational numbers, including square roots, and compare them to rational numbers.

4. Represent real number approximations with scientific notation.

5. Solve problems involving ratios and proportions (e.g., mixtures, comparisons, rates, measurement conversions, graphs, percent growth, taxes, depreciation).

2 Knowledge of algebra

1. Generate equivalent expressions (e.g., polynomials, radical expressions, rational expressions) to determine a quantity of interest within a context or solve for an unknown.

2. Determine key features of 2-variable relationships presented in various forms (e.g., tables, graphs, equations, written descriptions, function notation), and evaluate whether a relationship is a function.

3. Identify function types (i.e., linear, quadratic, cubic, exponential growth and decay, absolute value, square root, cube root, reciprocals of linear functions, step, piecewise linear), and determine whether a function is even or odd.

4. Solve equivalent algebraic expressions (e.g., polynomials, radical expressions, rational expressions) in mathematical and real-world problems using operations (e.g., associative, commutative and distributive laws, order of operations, laws of exponents) and properties of equality.

5. Interpret slopes and intercepts of a linear function and determine the equation of a line (i.e., passes through two given points, through one given point, perpendicular to a given line, parallel to a given line, has a given slope).

6. Solve absolute value and quadratic inequalities with one or two variables, within real-world or mathematical contexts representing solutions algebraically or graphically.

7. Evaluate systems of linear equations or linear inequalities that describe quantities or relationships in mathematical and real-world contexts.

8. Interpret the x-intercepts, y-intercept, vertex, line of symmetry, and concavity of a quadratic function representing real-world and mathematical situations.

9. Solve quadratic equations over the real and complex number systems.

10. Select graphical representations of and determine exponential functions representing real-world problems of exponential growth and decay.

11. Determine the impacts of shifting and scaling transformations on various representations (e.g., tables, graphs, formulas) presented in mathematical and real-world contexts.

12. Determine the inverse of a given function with description of its domain and range, the composition of 2 functions, and interpret inverses and compositions in mathematical and real-world contexts.

3 Knowledge of geometry and trigonometry

1. Classify triangles, quadrilaterals, and solids based on their defining attributes.

2. Solve mathematical and real-world problems involving properties of angles, using the Triangle Sum Theorem, parallel lines cut by a transversal, relationships between angles of triangles, and the formula for the sum of interior angles of polygons.

3. Prove and apply relationships about lines, angles, triangles, and quadrilaterals in mathematical and real-world contexts.

4. Apply Side-Side-Side, Side-Angle-Side, Angle-Side-Angle, Angle-Angle-Side, Angle-Angle and Hypotenuse-Leg criteria to prove pairs of triangles, overlapping triangles, and figures composed of triangles are congruent or similar, including the concept of congruence and similarity of triangles to solve mathematical and real-world problems.

5. Apply translations, rotations, reflections and scaling transformations and sequences, based on the relationship between a 2D geometric figure and its pre-image, to demonstrate congruence and similarity.

6. Apply coordinate geometry to classify and justify properties of lines, triangles, quadrilaterals, and circles, and solve mathematical and real-world problems (e.g., using the distance formula to determine distances between points and between parallel lines).

7. Identify the shapes of 2D cross sections of 3D figures and of 3D figures generated by rotations of 2D figures.

8. Solve mathematical and real-world problems involving proportional relationships between similar 2D and 3D figures, including problems involving scale factors of measurements of similar figures (e.g., perimeter, volume).

9. Solve mathematical and real-world problems involving formulas for the perimeter, circumference and area of 2D figures and the surface area and volume of 3D figures.

10. Determine and justify geometric constructions (e.g., copy or bisect a segment or an angle).

11. Solve mathematical and real-world problems involving the lengths and intersection angles of secants, chords, and tangent segments, the measures of central and inscribed angles in circles and semicircles, and the areas of sectors of circles.

12. Select equations and graphs representing a conic section (e.g., circle, parabola) on a coordinate plane, and apply conic sections to model real-world situations.

13. Apply basic right triangle trigonometry and the Pythagorean Theorem to determine unknown sides of right triangles.

14. Solve mathematical and real-world problems using trigonometric ratios and the laws of sines and of cosines.

15. Determine the values for and identify the graphs of the six trigonometric functions, including their key features.

16. Select graphical representations of and solve periodic mathematical and real-world problems that are modeled with trigonometric functions.

17. Convert between rectangular and polar coordinates, and select graphical representations of polar equations in the polar plane.

18. Select graphical representations of curves in a plane represented parametrically, and apply parametric equations to model problems involving motion in the plane.

19. Interpret the language of logic, including the converse, inverse, and contrapositive of an "if … then" statement, and evaluate the validity of informal and formal geometric arguments.

4 Knowledge of data analysis, statistics, and probability

1. Identify and determine appropriate measures of central tendency and measures of variation of a numerical data set.

2. Apply the mean and standard deviation of a numerical data set to fit it to a normal distribution and estimate population percentages.

3. Interpret information and patterns from a numerical data display and the shape of its distribution (i.e., symmetry, gaps, clusters, outliers, mode, range).

4. Identify displays for univariate numerical and categorical data (e.g., histograms, box plots, bar charts, frequency tables).

5. Determine population total, mean, and percentage using data from a survey, considering margin of error.

6. Identify appropriate processes used to design statistical experiments, including the use of randomized trials and proper sampling methods to reduce possible sources of bias.

7. Determine the properties of correlations in bivariate data displayed in scatter plots and 2-way frequency tables, representing real-world situations.

8. Select linear functions that fit to real-world bivariate numerical data that suggest a possible linear association, and interpret the x- and y-intercepts.

9. Use a variety of methods (e.g., permutations, combinations, tables, tree diagrams, addition and multiplication rules) to determine the probabilities and conditional probabilities of events in probability experiments (e.g., complements of events and unions, intersections of independent and dependent events).

10. Analyze 2-way frequency tables and relative frequency tables summarizing real-world bivariate categorical data, using the data or conditional, marginal, or joint relative frequencies from the data, and interpret the quantities in such a table within a context.

11. Determine an appropriate sample space for a simple experiment (e.g., rolling a die, drawing an object randomly from a bag, spinning a spinner) or a repeated simple experiment (e.g., repeatedly tossing a coin, rolling several dice, drawing an object repeatedly from a bag with replacement).

12. Compare experimental and theoretical probabilities to make predictions and draw conclusions about real-world situations.

13. Calculate the expected value and standard deviation of a random variable to solve real-world problems (e.g., compare the expected payoffs and risks of different decisions).

5 Knowledge of precalculus and calculus

1. Solve mathematical and real-world problems involving quantities that can be represented by vectors (e.g., displacement, velocity, acceleration, force, magnetic fields), using addition, subtraction, and scalar multiplication of vectors represented both algebraically and on the coordinate plane.

2. Solve mathematical and real-world problems using exponential and logarithmic functions and equations (e.g., exponential functions with base e and natural logarithms) and apply the properties of logarithmic functions.

3. Apply the Fundamental Theorem of Algebra and the Factor Theorem to analyze polynomials (e.g., using the graph of a polynomial to help determine its algebraic formula).

4. Select rational functions representing mathematical and real-world problems in written and graphical form, and interpret key features of the graphs.

5. Determine and apply arithmetic and geometric sequences, defined explicitly or recursively, in mathematical and real-world problems.

6. Determine limits using theorems concerning sums, products, and quotients of functions.

7. Determine derivatives of algebraic, exponential, logarithmic, and trigonometric functions and combinations of functions formed using arithmetic operations and compositions.

8. Apply differentiation to determine features of functions representing mathematical and real-world problems (e.g., intervals, concavity, local maxima and minima, tangent lines of graphs).

9. Apply properties of integration and substitution to determine anti-derivatives of algebraic, exponential, logarithmic, and trigonometric functions and combinations formed by using arithmetic operations.

10. Apply definite integrals to solve mathematical and real-world problems involving distance, area, and volume.

11. Calculate binomial expansions to a positive integral power or determine a specified term in the expansion.

6 Knowledge of student reasoning and instructional practices

1. Identify appropriate methods to facilitate instruction in using mathematical strategies, concepts, and procedures with fluency to solve problems in various real-world or mathematical contexts.

2. Identify opportunities for students to evaluate the reasonableness of their results, and assess the validity of students' mathematical arguments.

3. Identify patterns to make connections between mathematical and real-world problems across subject areas, and analyze a sequence of concepts for mathematical continuity.

4. Select appropriate mathematical representations (e.g., verbal statements, tables, algebraic expressions) and instructional tools for teaching mathematical concepts to all students.

5. Analyze learning progressions to demonstrate how students' mathematical knowledge and skills develop over time among concrete, representational, and abstract modes of understanding.

6. Analyze and interpret individual student mathematics assessment data using a variety of assessment formats to guide instructional decisions and differentiate instruction.

7. Analyze students' mathematical misconceptions, errors, and gaps in knowledge and choose instructional approaches to promote student achievement.

Middle Grades English
5–9

Section 14

Middle Grades English 5–9

1 Knowledge of how the characteristics of middle school students affect student learning and instructional decisions in English language arts

1. Determine how students' development of reading skills (i.e., phonological awareness, decoding and word analysis, encoding, fluency, vocabulary, comprehension) may affect instructional decisions in English language arts.

2. Determine evidence-based practices to differentiate instruction based on student needs.

3. Determine evidence-based practices for the instruction of English language learners.

4. Determine evidence-based practices for the instruction of students with disabilities.

2 Knowledge of applications of evidence-based practices in teaching English language arts

1. Select and apply evidence-based practices that are aligned with state standards at the appropriate grade level.

2. Select appropriate technology that incorporates evidence-based practices for English language arts instruction.

3. Apply evidence-based practices in the integration of English language arts content with other disciplines.

4. Determine appropriate methods and materials for meeting the diverse learning needs of students in English language arts, including implementing accommodations and modifications required by students' education plans (e.g., explicit and systematic instruction, corrective feedback).

5. Determine and apply instructional practices for teaching English language arts.

6. Determine and apply the components of text complexity (i.e., quantitative, qualitative, and student centered) to text selection.

7. Select and analyze appropriate measures for assessing reading performance (i.e., foundational reading skills, vocabulary, and comprehension) and use data to inform instruction.

3 Knowledge and understanding of literary and informational texts

1. Determine the connotative and denotative meanings of words and phrases by analyzing word relationships, context clues, and figurative language or selecting appropriate reference materials.

2. Determine the meanings of words through understanding of Greek and Latin roots and affixes, etymology of the English language, and word derivations.

3. Analyze how the use of various literary and rhetorical devices (e.g., symbolism, allusion, irony, foreshadowing, figurative language) helps establish and achieve an author's purpose, enhances meaning, and creates tone and mood in texts across genres.

4. Determine the characteristics of various genres of literary texts (e.g., fiction, poetry, drama) and analyze how key elements (e.g., setting, plot, characterization, conflict, point of view, theme, tone) enhance or add layers of meaning and style.

5. Analyze a range of texts by a variety of authors within and across literary periods (e.g., colonial and early national, romantic, realism, naturalism, modernism, contemporary) and genres.

6. Determine the structures (e.g., description, problem/solution, chronological, comparison and contrast, cause and effect, sequence) of informational texts and analyze how structure conveys purpose and meaning in texts.

7. Determine the characteristics of informational text features (e.g., table of contents, headings, captions, photographs, graphs, charts, illustrations, glossaries, footnotes, bold words, sidebars) and analyze how text features convey purpose and meaning.

8. Determine the author's purpose and perspective in an informational text and evaluate how relevant details support the implied or explicit central ideas of a text.

9. Evaluate an argumentative text by analyzing the author's reasoning, effectiveness and validity of claims, bias, and use of rhetorical devices (e.g., antithesis, irony, metonymy) and appeals (e.g., logos, ethos, pathos).

4 Knowledge and understanding of communication skills, techniques, and processes

1. Select and apply techniques for writing a personal or fictional narrative using a logical sequence of events, precise words and phrases, figurative language, varied transitions, and a clearly established point of view.

2. Select and apply techniques for writing an expository text to explain and analyze information from various sources using relevant supporting details and elaboration, logical organization, varied purposeful transitions, and a tone appropriate to the task.

3. Select and apply techniques for writing an argument that supports claims and addresses counterclaims using logical and valid reasoning, relevant and credible evidence from multiple sources, logical organization, varied purposeful transitions, and a tone appropriate to the task.

4. Select and apply techniques for integrating diverse digital media to emphasize the relevance of topics and ideas in written texts.

5. Select and apply techniques for using digital tools and collaborative platforms to produce and share purposeful writing.

6. Select and apply strategies for engaging in the research process (e.g., developing a research question, selecting reliable and valid sources, refining the scope of a question based on findings, generating additional questions for further research).

7. Select and apply techniques for presenting information orally using a logical organization that supports the central idea with credible evidence, clear perspective, coherent focus, and appropriate nonverbal cues.

8. Select and apply evidence-based practices for each stage of the writing process (i.e., planning, drafting, revising, editing, and publishing), including techniques for improving writing (e.g., varying sentence types, revising for clarity and cohesiveness).

9. Select and apply appropriate collaborative techniques and active-listening skills for engaging in academic discussions (e.g., supporting claims with evidence, justifying reasoning, building on ideas, propelling the conversation).

10. Apply evidence-based practices for integrating academic and domain-specific vocabulary in speaking and writing.

11. Apply standard English grammar, usage, and conventions (i.e., capitalization, punctuation, and spelling).

5 Knowledge of pedagogical content for teaching English language arts

1. Select appropriate instructional practices for teaching students the conventions of standard English (e.g., grammar, usage, capitalization, punctuation, spelling), the types of sentences (i.e., simple, compound, complex, and compound-complex), and the effective use of sentence variety.

2. Select and apply evidence-based practices for teaching students how to determine the meaning of words and phrases by using context clues, word structure, Greek and Latin roots and affixes, etymology of the English language, and word derivations.

3. Select and apply appropriate strategies for explicitly teaching students how to integrate academic and domain-specific vocabulary in speaking and writing.

4. Select and apply evidence-based practices for teaching students how to comprehend and analyze literary texts.

5. Select and apply evidence-based practices for teaching students how to comprehend and analyze informational texts.

6. Select and apply appropriate instructional practices for teaching students how text structures and text features support meaning.

7. Select and apply appropriate instructional practices for teaching students reading and writing processes for a variety of discipline-specific tasks, purposes, and audiences.

8. Select and apply appropriate instructional practices for facilitating students' responses to literary and informational texts through writing, speaking, and use of multimedia and digital platforms.

9. Select and apply appropriate instructional practices for teaching students the research process (e.g., gathering relevant information, synthesizing information from multiple sources, paraphrasing and citing sources to avoid plagiarism).

10. Select and apply appropriate strategies for teaching students to present information in a way that conveys coherent ideas with a clear perspective and integrates diverse multimedia elements (e.g., artifacts, audio representations, digital representations).

11. Select and apply appropriate instructional practices for teaching students how to analyze and evaluate the purpose of information presented in multimedia formats.

12. Select and apply appropriate instructional practices for teaching students how to use active-listening and collaborative skills for engaging in academic conversations (e.g., supporting claims with evidence, building on ideas, propelling the conversation).

13. Select and apply instructional practices for providing meaningful feedback on student writing throughout the writing process and teaching students how to improve their writing by planning, revising, editing, and utilizing adult and peer reviews.

6 Knowledge of various assessments and use of assessment data to drive instructional decisions within English language arts

1. Select appropriate and effective, formal and informal assessment tools for use in English language arts.

2. Analyze and evaluate results of formal and informal assessments to determine students' strengths and needs.

3. Analyze and evaluate results of formal and informal assessments to adjust instruction as needed (e.g., differentiation, reteaching, explicit and systematic instruction, scaffolding, small-group instruction, peer tutoring).

4. Determine appropriate ways to share student assessment data with students and stakeholders.

7 Ability to evaluate a student's argumentative essay

1. Evaluate a student's ability to argue a position by making a strong, logical claim and supporting the claim with valid reasoning, elaboration, and relevant and sufficient evidence from multiple sources.

2. Evaluate a student's ability to rebut counterclaims using relevant evidence.

3. Evaluate a student's use of logical organization, purposeful transitions, varied sentences, academic and domain-specific vocabulary, and appropriate tone.

Middle Grades General Science
5–9

Section 04

Middle Grades General Science 5–9

1 Conceptual and quantitative knowledge of the structure and behavior of matter

1. Analyze the physical and chemical properties of matter (e.g., mass, volume, density, chemical reactivity).
2. Distinguish between the states of matter.
3. Apply knowledge of the gas laws.
4. Identify the major discoveries in the development of the atomic theory.
5. Identify the characteristics of elements, compounds, and mixtures.
6. Apply knowledge of symbols, formulas, and equations for common elements and compounds (e.g., acids, bases, salts, carbon compounds) and their reactions.
7. Identify characteristics and functions of the components of an atom.
8. Identify chemical or physical properties of elements based on their placement on the periodic table.
9. Identify characteristics of types of chemical bonding (e.g., covalent, ionic, metallic, hydrogen).
10. Identify types of chemical reactions and their characteristics.

2 Conceptual and quantitative knowledge of forces and motion

1. Differentiate between the types and characteristics of contact forces and forces acting at a distance, and their interactions.
2. Identify applications of Newton's laws of motion.
3. Solve problems involving force or motion.
4. Identify types, characteristics, and properties of waves.
5. Analyze characteristics of wave phenomena (e.g., intensity, refraction, interference, Doppler effect, wave-particle duality) as they apply to real-world situations.
6. Identify origins, characteristics, and examples of electricity.
7. Identify types of magnets and characteristics of magnetic fields.
8. Apply knowledge of magnets and magnetic fields to real-world situations (e.g., generators, solenoids).

9. Identify characteristics of motion as they apply to real-world situations (e.g., speed, velocity, acceleration, linear and angular momentum).

3 Conceptual and quantitative knowledge of energy and its effects

1. Differentiate between forms of energy and their transformations.
2. Relate energy to transitions between states of matter.
3. Distinguish between temperature, heat, and thermal energy.
4. Distinguish between the types of thermal energy transfer (e.g., radiation, conduction, convection).
5. Apply the laws of thermodynamics to real-world situations.
6. Differentiate between potential and kinetic energy.
7. Identify characteristics of nuclear reactions.
8. Identify the regions of the electromagnetic spectrum and energy associated with each.
9. Identify the use of light and optics in real-world applications (e.g., optical instruments, communication).
10. Solve problems involving energy, work, power, mechanical advantage, and efficiency.
11. Apply the laws of conservation of mass and energy to chemical reactions, nuclear reactions, physical processes, and biological processes.
12. Identify types, characteristics, and measurements of electrical quantities.
13. Apply knowledge of currents, circuits, conductors, insulators, and resistors to real-world situations.
14. Solve mathematical problems involving current, voltage, resistance, power, and energy in direct current (DC) circuits.

4 Knowledge of Earth and the processes that affect it

1. Relate surface and subsurface geologic processes to the movement of tectonic plates.
2. Trace the development of the theory of continental drift to the current theory of plate tectonics.
3. Relate the characteristics of geologic structures to the mechanisms by which they are formed.

4. Identify the evidence used to define geologic eras (e.g., geologic events, biotic factors, abiotic factors).

5. Apply methods for determining geologic age (e.g., law of superposition, radioactive decay, relative dating).

6. Interpret various charts and models (e.g., topographic, geologic, weather).

7. Identify the characteristics of ocean currents and how they influence weather patterns.

8. Identify characteristics of Florida's geology and its formation.

9. Identify the major processes of formation and properties of rocks, minerals, and fossils.

10. Distinguish between the processes of weathering, erosion, and deposition and their products.

11. Identify the characteristics and functions of the atmospheric layers.

12. Relate atmospheric conditions to weather.

13. Identify the factors that contribute to the climate of a geographic area.

14. Identify the movement of water in the hydrologic cycle, including sources of water, types of precipitation, and causes of condensation.

15. Analyze ways in which earth and water interact (e.g., soil absorption, runoff, leaching, groundwater, karst topography).

16. Identify various forms of water storage (e.g., aquifers, reservoirs, watersheds).

17. Analyze interactions between the atmosphere, geosphere, hydrosphere, biosphere, and cryosphere and the effects of these interactions.

5 Knowledge of space science

1. Identify consequences of Earth's motions and orientation (e.g., seasons, tides, lunar phases).

2. Identify the properties of stars and the factors that affect their evolutionary patterns.

3. Identify devices and techniques for collecting and analyzing data about stars and other celestial objects.

4. Explain the role of space exploration and its impact on technological advancements.

5. Identify the components of the solar system (e.g., Kuiper belt, Oort cloud), their characteristics, how they interact (e.g., solar winds, impacts, gravitational attraction), and how they evolve.

6. Evaluate celestial objects in order to determine formation, age, location, characteristics, and evolution.

6 Knowledge of processes of life

1. Identify the relationship between biological and chemical processes (e.g., cellular respiration, ATP energy transfer) necessary for life.

2. Compare prokaryotes and eukaryotes.

3. Relate cell organelles to their functions.

4. Identify the sequence of events, the significance of the process, and the consequences of irregularities during mitosis and meiosis.

5. Apply principles of Mendelian genetics to monohybrid and dihybrid crosses and crosses involving linked genes.

6. Apply principles of human genetics, including relationships between genotypes and phenotypes and causes and effects of disorders.

7. Analyze the genetic code and the roles of DNA and RNA in replication and protein synthesis.

8. Classify organisms based on the levels of biological taxonomy.

9. Identify characteristics of viruses, bacteria, protists, and fungi.

10. Differentiate between structures and processes of plant and animal cells and their organelles.

11. Identify plant structures and their functions.

12. Identify the major steps of plant processes (e.g., photosynthesis, respiration, electron transport, transpiration, reproduction).

13. Identify the processes of animal physiology (e.g., digestion, respiration).

14. Identify the structures of the organs and organ systems of various kinds of animals, including humans.

15. Analyze behaviors or adaptations of animals and plants that enable them to survive.

16. Interpret cell theory and how its discovery relates to the process of science.

17. Identify how evolution is supported by the fossil record, comparative anatomy, embryology, biogeography, molecular biology, genetics, and observed change.

18. Evaluate the roles of adaptation, genetic variation, mutation, and extinction in natural selection.

19. Interpret the impact of biotechnology on the individual, society, and the environment, including medical and ethical issues.

7 Knowledge of the effects of physical and biological factors on the environment

1. Identify components and sequences of biogeochemical cycles (e.g., carbon, oxygen, hydrogen, nitrogen).

2. Identify issues related to the development, use, and conservation of natural resources.

3. Evaluate environmental factors and their impact on the adaptation and survival rates of organisms.

4. Identify the major characteristics of world biomes and communities, including succession and interrelationships of organisms.

5. Identify how biotic and abiotic factors influence ecosystems.

6. Analyze interactions between microorganisms and the environment.

7. Identify the effects of homeostasis on the survivability of an organism.

8. Relate the interactions of biotic and abiotic factors to the flow of energy and biomass within a system.

9. Analyze the relationship between natural factors and human activities as they affect Florida's ecosystems.

8 Knowledge of the science learning environment

1. Identify legal and ethical requirements for proper use, care, handling, and disposal of organisms.

2. Identify the safe and appropriate techniques used in the preparation, storage, dispensing, and supervision of materials used in science instruction.

3. Identify appropriate substitutions for materials and activities necessary for effective science instruction.

4. Identify the federal and state legal requirements for safe preparation, use, storage, and disposal of chemicals and other materials.

5. Use multiple assessment tools and strategies to identify and address student misconceptions.

6. Select appropriate strategies for teaching scientific inquiry.

7. Identify appropriate technological tools that facilitate the learning of science.

9 Knowledge of process skills and application of scientific inquiry

1. Apply appropriate scientific process skills to observe and analyze natural phenomena and communicate findings.

2. Apply scientific inquiry, including scientific methods, to investigations.

3. Apply knowledge of mathematics and technology to scientific investigation.

4. Compare the methods used in the pursuit of a scientific explanation as applied in different fields of science such as geology, astronomy, physics, and biology.

5. Identify the traits of scientists and how they affect the development of scientific knowledge.

6. Identify the assumptions of scientific knowledge (e.g., durable, open to change).

7. Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation.

8. Evaluate the impact of the historical and cultural development of science on the advancement of scientific knowledge.

9. Compare the development, use, benefits, and limitations of theories, laws, hypotheses, and models.

10. Analyze the interdependence between scientific knowledge and economic, political, social, and ethical concerns.

Middle Grades Mathematics
5–9

Section 25

Middle Grades Mathematics 5–9

1 Knowledge of number sense, operations, and proportionality

1. Compare and convert between rational numbers represented in various ways (i.e., fractions, terminating and repeating decimals, percentages, number line).

2. Solve problems by performing operations with rational numbers, using estimates and algorithms, and evaluate multi-step expressions using order of operations (e.g., expressions with integer exponents, multiple levels of grouping symbols, and absolute value).

3. Estimate irrational numbers, including square roots, and compare them to rational numbers.

4. Represent and perform operations with real number approximations with scientific notation, giving attention to significant digits.

5. Apply factors of whole numbers to arithmetic operations (e.g., common factors, LCD, GCM).

6. Solve problems involving ratios and proportions (e.g., mixtures, comparisons, rates, measurement conversions, graphs, percent growth, taxes, depreciation).

7. Apply properties of operations (i.e., associative, commutative, distributive, inverse relationships between operations) in performing multi-step arithmetic operations with rational numbers.

8. Solve problems by performing operations with numbers involving radicals and with rational numbers with rational exponents, making use of the laws of exponents.

9. Interpret operations on rational numbers and radicals within mathematical and real-world contexts.

10. Apply properties of operations (i.e., associative, commutative, distributive, inverse relationships between operations) in performing multi-step arithmetic operations with rational numbers (i.e., associative, commutative, distributive, inverse relationships between operations).

2 Knowledge of algebra

1. Identify and apply numerical and algebraic patterns, using tables, graphs, written descriptions, and formulas.

2. Evaluate a function at a given value of its input to determine whether a relationship presented in various forms (e.g., tables, written descriptions, function notation) represents a function and to determine its type (i.e., linear, quadratic, cubic, exponential growth and decay, absolute value, square root, cube root).

3. Apply operations with exponents and radicals to generate equivalent expressions (e.g., polynomials, radical expressions, rational expressions).

4. Solve linear and absolute value equations or inequalities with one or two variables, representing solutions algebraically or graphically, and interpret the key features (vertex, line of symmetry) of an absolute value function within real-world or mathematical contexts.

5. Identify the slope and intercepts of a line using a graph, table, or equation, and determine the equation of a line (i.e., passes through two given points, through one given point, perpendicular to a given line, parallel to a given line, has a given slope).

6. Solve and interpret systems of two-variable linear equations and inequalities, algebraically, graphically, and in real-world contexts.

7. Identify and interpret the x-intercepts, y-intercept, vertex, line of symmetry, and concavity of a quadratic function representing real-world and mathematical situations.

8. Analyze key features of quadratic functions presented in mathematical and real-world contexts, and solve using a variety of methods (e.g., factoring, quadratic formula, completing the square, graphing).

9. Determine and select graphical representations of exponential functions in the form ab^x and $a(1 + r)^x$ that represent real-world problems of exponential growth and decay (e.g., problems about depreciation, compound interest, population growth).

10. Determine the impacts of shifting and scaling transformations on the formulas for linear, quadratic, and absolute value functions.

3 Knowledge of geometry

1. Classify triangles, quadrilaterals, and solids based on their defining attributes.

2. Apply formulas for the area of a triangle and composite figures to find solutions for various shapes (e.g., rectangles, trapezoids, parallelograms, rhombi).

3. Apply formulas for volume and surface area of solids (i.e., right solids, Cavalieri's principle, nets for non-right solids).

4. Solve mathematical and real-world problems involving formulas for the perimeter, circumference, and area of 2D figures and the surface area and volume of 3D figures.

5. Solve mathematical and real-world problems using the coordinate plane.

6. Solve mathematical and real-world problems involving proportional relationships between similar 2D and 3D figures.

7. Solve mathematical and real-world problems using the Triangle Inequality Theorem, the Pythagorean Theorem, and the Pythagorean Theorem converse.

8. Solve mathematical and real-world problems involving formula for the sum of interior angles of polygons, the Triangle Sum Theorem, properties of angles, parallel lines cut by a transversal, and relationships between angles of triangles.

9. Apply translations, rotations, reflections, and scaling transformations based on the relationship between a 2D geometric figure and its pre-image to demonstrate congruence and similarity.

10. Apply Side-Side-Side, Side-Angle-Side, Angle-Side-Angle, Angle-Angle-Side, Angle-Angle, and Hypotenuse-Leg criteria to prove pairs of triangles are congruent or similar, including the concepts of congruence and similarity of triangles to solve mathematical and real-world problems.

11. Determine the center, the radius, and the equation of a circle, and select graphical representations of a circle on a coordinate plane.

4 Knowledge of data analysis, statistics, and probability

1. Identify and determine measures of central tendency and measures of variation of a numerical data set.

2. Interpret information and patterns from a numerical data display and from the shape of its distribution (i.e., symmetry, gaps, clusters, outliers, mode, range).

3. Identify displays for univariate numerical and categorical data (e.g., histograms, box plots, bar charts, frequency tables).

4. Determine estimates for a population total, mean, and percentage using data from a survey.

5. Identify statistical questions and samples to draw inferences about a population.

6. Determine the properties of correlations in bivariate data displayed in scatter plots and frequency tables, representing real-world situations.

7. Select linear functions that fit to real-world bivariate numerical data and that suggest a possible linear association, and interpret the x- and y-intercepts.

8. Determine the theoretical probabilities of outcomes (e.g., rolling a 3 on a standard 6-sided die) and events (e.g., drawing two red balls in a row when drawing with replacement from a bag containing a given number of red and green balls) in simple and repeated experiments.

9. Determine and compare experimental and theoretical probabilities to make predictions and draw conclusions about real-world situations.

5 Knowledge of student reasoning and instructional practice

1. Analyze real-world contexts across subject areas to represent them with appropriate mathematical expressions and equations.

2. Identify appropriate methods to facilitate instruction in using mathematical strategies, concepts, and procedures with mathematical fluency to solve problems in various real-world or mathematical contexts.

3. Identify opportunities for students to evaluate the reasonableness of their results, and assess the validity of students' mathematical arguments.

4. Identify patterns to make mathematical connections between different mathematical and real-world problems across subject areas, and analyze a sequence of concepts for mathematical continuity within and across grade levels.

5. Select appropriate mathematical representations (e.g., verbal statements, pictures, graphs, algebraic expressions) and instructional tools for teaching mathematical concepts to all students.

6. Analyze learning progressions to demonstrate how students' mathematical knowledge and skills develop over time among concrete, representational, and abstract modes of understanding.

7. Analyze and interpret individual student mathematics assessment data using a variety of assessment formats to guide instructional decisions and differentiate instruction.

8. Analyze students' mathematical misconceptions, errors, and gaps in knowledge and choose instructional approaches to promote student achievement.

Middle Grades Social Science
5–9

Section 38

Middle Grades Social Science 5–9

1 Knowledge of history

1. Identify major historical events and how they are related by cause and effect.

2. Analyze examples of primary source documents for historical perspective.

3. Identify cultural, political, social, economic, and technological contributions made by civilizations in Africa, the Americas, Asia (including the Middle East), Europe, and Oceania.

4. Relate major historical events and movements to physical and human geographic factors.

5. Identify significant historical leaders and events and their influence on world civilizations.

6. Analyze the causes and effects of exploration, settlement, and growth in Africa, the Americas, Asia (including the Middle East), Europe, and Oceania.

7. Identify individuals, ideas, and events that have influenced economic, cultural, social, and political institutions in the United States.

8. Identify immigration and settlement patterns that have shaped the history of Florida.

9. Identify significant individuals, events, and social, cultural, political, and economic characteristics of different periods of Florida history.

2 Knowledge of geography

1. Identify essential themes and elements in geography and the terms associated with them.

2. Interpret maps and other graphic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

3. Use mental maps to organize information about people, places, and environments.

4. Analyze the factors (e.g., topographic, environmental, economic) that influence the selection of a location for a specific activity (e.g., industrial and urban development, agriculture, transportation).

5. Interpret statistics that show how places differ in their human and physical characteristics.

6. Identify cultural, political, economic, sociological, and technological characteristics that define, link, or divide regions.

7. Identify ways in which people adapt to an environment through the production and use of clothing, food, and shelter.

8. Evaluate the effects of human activity and technology on the environment.

9. Identify physical, cultural, social, economic, and political reasons for the movement of people in the world, nation, or state.

10. Analyze factors contributing to the level of economic development in various geographic regions.

11. Identify examples of interdependence between regions of the world.

3 Knowledge of civics and government

1. Identify the structure, functions, and purposes of government.

2. Identify major concepts, content, and purposes of the U.S. Constitution and other historical documents.

3. Compare and contrast the various political systems in the world (e.g., monarchy, parliamentary system, federal republic, democracy, totalitarianism).

4. Identify the characteristics of the U.S. electoral system and the election process.

5. Identify the major structures and functions of federal, state, and local governments in the United States.

6. Analyze relationships between social, cultural, economic, and political institutions and systems.

7. Identify the tenets (e.g., rule of law, innocent until proven guilty), institutions, and processes of the U.S. legal system.

8. Identify major U.S. Supreme Court cases and their impact on society.

9. Evaluate the goals, conduct, and consequences of U.S. foreign policy.

10. Identify features and concepts of international relations (e.g., United Nations, Organization of the Petroleum Exporting Countries, Red Cross, Organization of American States, European Union).

11. Identify the rights and responsibilities of a U.S. citizen in society.

4 Knowledge of economics

1. Analyze the effects of scarcity on the choices made by governments and individuals.

2. Compare and contrast the characteristics of various economic systems.

3. Identify the role of markets in decisions affecting production, distribution, and consumption.

4. Evaluate factors to consider when making consumer decisions.

5. Identify the advantages and disadvantages of various kinds of credit.

6. Identify factors involved in global economic interdependence and trade between nations.

7. Identify the purposes and effects of various types of taxes.

5 Knowledge of social science curriculum and instruction

1. Identify the interdisciplinary relationships of the social sciences.

2. Apply nontextbook resources (e.g., technology, media, community) for use in social science instruction.

3. Identify how social science content can be integrated with other areas of the curriculum.

4. Identify various assessment strategies for the social sciences.

5. Select strategies for teaching the social sciences to differentiated populations.

6. Identify strategies for teaching the use of social science resources (e.g., primary source documents, charts, maps, graphs).

Music
K–12

Section 28

Music K–12

1 Knowledge of music education fundamentals

1. Identify and analyze elements of rhythm.
2. Identify and analyze scales and melodic structures.
3. Identify and analyze textures and harmonic functions.
4. Identify and analyze musical forms.
5. Interpret musical terms and symbols.
6. Identify and apply appropriate conducting techniques through score study.
7. Differentiate among eras, influential composers, and stylistic features in the Western musical tradition.
8. Identify and differentiate between influential composers and stylistic features in music (e.g., American, electronic, popular, jazz, roots, world).
9. Identify and differentiate among influential methodologies of music education (i.e., Dalcroze, Gordon, Kodály, Orff, Suzuki).

2 Knowledge of music standards-based curricula and pedagogy

1. Identify standard techniques for vocal and instrumental performance.
2. Determine vocal and instrumental classifications and ranges at various levels of physical development and maturation.
3. Evaluate and select developmentally appropriate repertoire.
4. Apply differentiated instructional strategies to facilitate students' musical independence, growth, and understanding.
5. Determine techniques to develop students' skills in improvisation, arranging, and composition.
6. Identify strategies for incorporating purposeful movement in music learning.
7. Apply instructional strategies to facilitate cross-curricular and cultural connections.
8. Identify strategies for integrating media and technology in music instruction.

3 Knowledge of music performance assessment and evaluation

1. Evaluate qualities of individual and ensemble performances (e.g., tone quality, technical preparation, musical effect).

2. Identify and apply methods for correcting inaccuracies in individual performances.

3. Identify and apply methods for correcting inaccuracies in ensemble performances.

4. Determine and apply techniques to measure and assess student progress.

4 Knowledge of music program management, ethics, and legal matters

1. Identify and apply appropriate procedures for fiscal responsibility and accountability.

2. Identify and apply ethical standards regarding plagiarism and copyright laws.

3. Identify methods for student recruitment, selection, placement, and retention in music courses.

4. Identify and evaluate strategies and resources for support and advocacy of music programs.

5. Identify and apply effective classroom organization and inventory maintenance (e.g., instruments, uniforms, music library).

Physical Education
K–12

Section 63

Physical Education K–12

1 Knowledge of the history and philosophy of the physical education profession

1. Identify historical events and analyze trends that have influenced the physical education profession.

2. Relate the goals and values of physical education to the philosophies of education that they reflect.

2 Knowledge of standards-based physical education curriculum development

1. Identify and differentiate the characteristics of various curriculum models.

2. Identify and analyze various factors to consider in curriculum planning, such as student ability, time (e.g., class duration, time of day, frequency), environment, equipment, facilities, space, and community resources.

3. Identify ways that national and state documents, standards, benchmarks, and philosophies can be used to design and develop curricula.

4. Identify and apply principles of long- and short-term planning (e.g., scope and sequence, annual plan, unit plan, lesson plan, emergency plans) to maximize learner participation and success.

5. Identify cross-curricular content and concepts for the design and development of physical education learning experiences.

3 Knowledge of developmentally appropriate physical education instructional strategies

1. Identify and apply strategies and adaptations that address the diverse needs of all students (e.g., cultural, linguistic, cognitive, motor, experiential).

2. Identify and distinguish between teaching styles, communication delivery systems, and materials that facilitate student learning.

3. Identify and apply motivational theories and techniques that enhance student learning.

4. Analyze developmentally appropriate instructional strategies, techniques, and research-based teaching methods that promote student learning.

5. Identify feedback as a strategy to facilitate student learning.

6. Identify differentiated instructional practices that enhance student learning.

4 Knowledge of human growth and development and motor learning as they relate to physical education

1. Select developmentally appropriate practices that demonstrate knowledge of human growth and development.

2. Apply learning theories and knowledge of human development to construct a positive learning environment that supports psychomotor, cognitive, and affective development.

3. Apply principles of motor development and motor learning to skill acquisition.

4. Identify and apply the principles of sequential progression of motor skill development.

5 Knowledge of developmentally appropriate movement skills and concepts related to physical education

1. Identify and apply movement concepts (e.g., spatial awareness, body awareness, relationships, effort) as they relate to physical education.

2. Identify and apply the fundamental movement patterns, including locomotor, nonlocomotor, and manipulative skills.

3. Identify and apply sequentially progressive activities that promote the acquisition of skills in the psychomotor, cognitive, and affective domains.

4. Identify and apply appropriate cues and prompts for teaching movement skills.

5. Apply mechanical principles of motion to various forms of movement.

6. Analyze the mechanics of a skill or sequence of movements and identify ways in which students can improve their performance.

7. Identify how components of skill-related fitness affect performance.

6 Knowledge of lifetime health, wellness, and physical fitness

1. Analyze data from physical fitness assessments and select strategies for improving student levels of health-related physical fitness.

2. Identify the health-related components in a personal fitness program.

3. Demonstrate knowledge of nutrition and exercise and their roles in meeting the needs of all students.

4. Identify health risks and benefits associated with physical activity.

5. Apply training principles and guidelines to improve personal fitness.

6. Identify exercises that benefit the major muscle groups of the human body.

7. Determine how human body systems (e.g., muscular, cardiovascular, nervous, skeletal) adapt to physical activity.

8. Identify the contributions of physical education to lifetime health, wellness, and physical fitness.

9. Identify community opportunities for participation in a variety of physical activities.

7 Knowledge of cognitive, social, and emotional development through physical education and physical activity

1. Identify the role physical education can play in developing an understanding of diversity.

2. Identify the role physical education and physical activity can play in developing responsible behaviors and values.

3. Identify the intellectual, sociological, and psychological benefits that occur through participation in physical activities.

4. Identify major factors associated with the development of social and emotional health through physical activity (e.g., communication skills, self-concept, fair play, conflict resolution, character development, stress management).

8 Knowledge of various types of assessment strategies that can be used to determine student levels and needs in physical education

1. Identify and apply assessment strategies, including authentic and traditional methods, for appropriate use within the cognitive domain.

2. Identify and apply assessment strategies, including authentic and traditional methods, for appropriate use within the affective domain.

3. Identify and apply assessment strategies, including authentic and traditional methods, for appropriate use within the psychomotor domain.

4. Analyze appropriate assessment strategies for curriculum design, lesson planning, and program evaluation.

5. Identify appropriate assessment strategies for an inclusive environment.

6. Determine appropriate physical fitness assessment strategies for use within physical education.

9 Knowledge of strategies that promote an effective learning environment

1. Identify procedures for selecting and maintaining appropriate equipment and facilities to enhance student learning.

2. Identify organizational strategies that create and sustain an effective learning environment (e.g., rituals and routines, maximum participation, rules and standards).

3. Identify supervisory and behavioral management techniques that enhance student learning.

4. Determine appropriate action for the care and prevention of injuries in physical education.

10 Knowledge of laws, legislation, and liabilities that pertain to physical education

1. Identify major federal and state legislation that impacts physical education.

2. Identify legal liabilities applicable to physical education.

11 Knowledge of appropriate safety considerations, rules, strategies, and terminology related to physical education and a variety of physical activities

1. Apply appropriate rules and strategies of play to game and sport situations.

2. Identify terminology for physical education and physical activities.

3. Identify safety considerations for a variety of physical activity settings.

12 Knowledge of professional ethics, advocacy, and development

1. Identify physical education professional development experiences that will enhance teacher effectiveness, promote collaboration, and improve student performance.

2. Identify professional organizations, professional literature, research, and other resources (e.g., code of ethics) that enhance a physical educator's continuous improvement.

3. Identify ways to advocate for physical education.

13 Knowledge of the appropriate use of technology as related to physical education

1. Determine the appropriate uses of technology in the physical education instructional process.

2. Determine the appropriate uses of technology in assessing student performance in physical education.

3. Identify ways that using technology in physical education supports cross-curricular learning.

4. Identify ways that all students can use technology in physical education.

Physics
6–12

Section 32

Physics 6–12

1 Knowledge of the nature of scientific investigation and instruction in physics

1. Identify the characteristics and processes of scientific inquiry.

2. Identify potentially hazardous situations in a physics laboratory and classroom, methods of prevention, and corrective actions.

3. Select the appropriate laboratory equipment for specific scientific investigations.

4. Relate the historical development of the major concepts, models, and investigations in physics to current knowledge (e.g., force and motion, conservation principles, fields, quantum theory).

5. Distinguish between scientific theories and laws in terms of their specific roles and functions.

6. Identify elements of guided inquiry (e.g., engaging through questioning, eliciting prior knowledge, engaging in thoughtful discussion, engaging in exploration, fostering data-based argumentation, providing for application) in the physics classroom and laboratory.

7. Identify the areas of teacher liability and responsibility in science-related activities, including accommodations for diverse student populations.

2 Knowledge of the mathematics of physics

1. Determine the validity of a formula based on dimensional analysis.

2. Combine vectors using graphic and trigonometric methods.

3. Determine the dot product and cross product of two vectors.

4. Convert between units of a given quantity (e.g., length, area, volume, mass, time, temperature).

5. Identify prefixes in the metric system and standard units of measure (e.g., newtons, meters, kilowatt-hours, teslas, electron volts, calories, horsepower).

6. Estimate the order of magnitude of a physical quantity.

7. Interpret the slope of a graph or area under the curve in relation to physical concepts.

8. Apply the concepts of accuracy, precision, uncertainty, and significant figures to measurements and calculations.

3 Knowledge of thermodynamics

1. Relate changes in length, area, or volume of a system to changes in temperature.
2. Distinguish between the three methods of heat transfer (i.e., conduction, convection, radiation).
3. Determine the amount of heat transferred by conduction or radiation.
4. Interpret segments of graphs of temperature versus heat added or removed (e.g., latent heats, specific heats).
5. Analyze pressure, volume, and temperature relationships using the ideal gas law.
6. Apply the first law of thermodynamics (i.e., energy conservation) to physical systems.
7. Calculate work done by or on a gas from pressure versus volume diagrams.
8. Interpret pressure versus volume diagrams (e.g., identify isobaric, isothermal, and adiabatic processes).
9. Determine the specific heat, latent heat, or temperatures of a substance, given appropriate calorimetric data.
10. Apply the second law of thermodynamics (i.e., entropy increase) to physical processes.
11. Relate temperature or pressure to kinetic molecular theory.

4 Knowledge of mechanics

1. Analyze the motion of an object moving in one dimension, given a graph (e.g., displacement versus time, velocity versus time, acceleration versus time).
2. Determine distance traveled, displacement, speed, velocity, acceleration, or time of travel for objects moving in one dimension.
3. Determine distance traveled, displacement, speed, velocity, acceleration, or time of travel for objects moving in two dimensions (e.g., projectile motion).
4. Apply Newton's laws of motion to problems involving linear motion of a body.
5. Apply Newton's laws of motion to problems involving circular motion of a body.
6. Identify action-reaction pairs of forces between two bodies.
7. Apply conservation of momentum to problems in one or two dimensions.
8. Analyze problems using the impulse-momentum theorem.
9. Analyze problems using Newton's universal law of gravitation (e.g., orbital motion).

10. Analyze problems involving static or kinetic frictional forces.

11. Apply conservation of mechanical energy.

12. Use Newton's second law to analyze problems involving two connected masses (e.g., Atwood machine, Atwood machine on inclined plane, blocks, massless pulley).

13. Analyze problems involving torque (e.g., equilibrium, rotational dynamics).

14. Apply conservation of angular momentum and conservation of energy to problems involving rotational motion.

15. Analyze problems involving work done on mechanical systems (e.g., power, work-energy theorem).

16. Analyze problems involving the relationships between depth, density of fluid, and pressure.

17. Analyze problems involving the buoyant force on a submerged or floating object (i.e., Archimedes' principle).

18. Analyze problems involving moving fluids (e.g., mass conservation, Bernoulli's principle).

19. Analyze problems involving center of mass.

20. Use free-body diagrams to analyze static or dynamic problems in two or three dimensions.

21. Analyze characteristics and examples of simple harmonic motion (e.g., oscillating springs, vibrating strings, pendula).

5 Knowledge of waves and optics

1. Identify characteristics of waves (e.g., velocity, frequency, amplitude, wavelength, period, pitch, intensity, phase, nodes, antinodes, transverse waveforms, longitudinal waveforms).

2. Analyze the motion of particles in a medium in the presence of transverse and longitudinal waves.

3. Identify factors that affect wave propagation and wave speed.

4. Analyze problems involving the superposition, or interference, of waves (e.g., beats, standing waves, interference patterns).

5. Analyze problems involving standing waves (e.g., open or closed tube, vibrating string).

6. Analyze the Doppler effect due to the motion of a source or receiver.

7. Analyze waves, using either graphical or mathematical representations.

8. Analyze reflection and refraction problems using the law of reflection and Snell's law).

9. Interpret the relationships between wavelength, frequency, and speed of light.

10. Analyze the effects of linear polarizing filters on the polarization and intensity of light.

11. Analyze the geometric optics of thin lenses and mirrors.

12. Analyze patterns produced by diffraction and interference of light (e.g., single-slit, double-slit, diffraction gratings).

13. Identify the use and characteristics of various optical instruments (e.g., eye, spectroscope, camera, telescope, microscope, corrective lenses).

14. Apply the relationship between intensity and distance from a point source (i.e., inverse-square law).

15. Compare qualitative features of the ranges of the electromagnetic spectrum.

6 Knowledge of electricity and magnetism

1. Determine the electric force on a point charge due to one or more other charges.

2. Determine the electric potential difference between two points in an electric field.

3. Analyze problems involving capacitance, with or without dielectrics.

4. Analyze the electric field due to a charge distribution.

5. Apply Gauss's law to determine or characterize an electric field.

6. Analyze charge distributions in conductors and nonconductors.

7. Simplify series and parallel combinations of resistors or capacitors.

8. Solve problems using Ohm's law.

9. Apply Kirchhoff's laws to analyze DC circuits.

10. Determine the power dissipated through one or more elements of a DC circuit.

11. Relate the resistance of a conductor to its geometry and resistivity.

12. Analyze problems involving the direction and magnitude of the magnetic force acting on moving charges (e.g., mass spectrometer).

13. Apply the laws of electromagnetic induction (i.e., Faraday's law, Lenz's law).

14. Analyze problems involving AC circuits (e.g., transformers, peak current, root-mean-square voltage, frequency, reactance, resonant frequency, impedance).

15. Identify principles and components involved in the operation of motors and generators.

16. Predict the magnetic fields associated with current-carrying conductors (e.g., long straight wires, loops, solenoids).

7 Knowledge of modern physics

1. Analyze problems based on the energy of a photon (e.g., photoelectric effect, $E = hf$).

2. Apply Einstein's theory of special relativity (e.g., light postulate, length contraction, time dilation).

3. Apply Einstein's mass-energy equivalence ($E = mc^2$).

4. Determine the allowed energies of quantum atomic states or of transitions between such states.

5. Compare the characteristics of alpha, beta, and gamma radiation.

6. Predict outcomes of radioactive decay processes (e.g., balancing a nuclear equation).

7. Calculate the age of a radioactive source, given data (e.g., half-life, activity, remaining mass, decayed fraction).

8. Differentiate between fission and fusion processes and their applications.

9. Analyze problems involving Heisenberg's uncertainty principle (e.g., momentum versus position, energy versus time).

10. Differentiate between historical models of the atom (e.g., Thomson's plum pudding, Rutherford, Bohr, electron cloud).

11. Identify characteristics of subatomic and elementary particles (e.g., protons, neutrons, electrons, photons, neutrinos, quarks, antiparticles).

12. Distinguish between the four fundamental forces of nature in terms of the particles they act upon, the relative distances over which they act, and their relative strengths.

13. Identify characteristics of the dual (i.e., wave and particle) nature of light and matter.

Prekindergarten/Primary
PK–3

Subtests in the Following Areas:

Developmental Knowledge
Language Arts and Reading
Mathematics
Science

Section 53

Prekindergarten/Primary PK–3
Subtest 1: Developmental Knowledge

1 Knowledge of child growth, child development, and relationships with families and the community

1. Identify the major effects of genetics, health, nutrition, public policy, environment, and economics on child development.

2. Identify the developmental stages (e.g., social-emotional, cognitive, language, physical) and the milestones for the typically developing child.

3. Identify atypical development (e.g., social-emotional, cognitive, language, physical).

4. Identify and distinguish the influences of substance abuse, physical abuse, and emotional distress on child development.

5. Identify diverse family systems and recognize their influences on children's early experiences which contribute to individual differences and development and learning.

6. Identify the influence of scientific research on theories of cognitive and social development, the principles of how children learn, and the development and implementation of instructional strategies.

7. Identify and apply strategies to involve families in their child's development and learning in all phases of school programs.

8. Identify and apply strategies to facilitate family and community partnerships.

2 Knowledge of the profession and foundations of early childhood (PreK–3) education

1. Identify theorists, theories, and developmental domains (e.g., physical, cognitive, social-emotional) in the fields of early childhood education and their implications for the classroom teacher of young children.

2. Identify models of early childhood curriculum (e.g., Montessori, Creative Curriculum).

3. Identify and analyze the impact of federal and state laws on education in the classroom (e.g., English for Speakers of Other Languages, Individuals with Disabilities Education Act).

4. Identify professional organizations, websites, and scholarly journals in the field of early childhood education.

5. Interpret professional standards set by early childhood and elementary educational organizations (e.g., National Association for the Education of Young Children, Association for Childhood Education International, National Council of Teachers of Mathematics, Southern Early Childhood Association).

6. Analyze the relationships among current educational issues, trends, and legislation and their impact on the field of early childhood education.

7. Analyze and apply ethical behavior and professional responsibilities as they relate to young children, families, colleagues, and the community (e.g., Florida Educator Accomplished Practices, Florida Department of Education Code of Ethics, National Association for the Education of Young Children Code of Ethics).

3 Knowledge of developmentally appropriate practices

1. Identify and apply developmentally appropriate practices that guide effective instruction.

2. Identify the components of effective organization and management, such as classroom rituals, routines, and schedules.

3. Identify ways to organize furniture, equipment, materials, and other resources in an indoor or outdoor environment in order to support early childhood development and curricula.

4. Identify and analyze strategies for short- and long-term planning to set instructional goals in alignment with standards for developing teacher objectives.

5. Identify strategies for designing appropriate objectives and developing, implementing, and assessing lesson plans.

6. Identify and select developmentally and/or age-appropriate instructional materials that enrich and extend active learning.

7. Apply a variety of methods of flexibly grouping children for the purposes of instruction.

8. Identify and apply characteristics of an integrated curriculum.

9. Identify characteristics of play as related to children's social, emotional, and cognitive development.

10. Identify strategies for building and nurturing trusting relationships with students.

11. Analyze and evaluate the use of evidence-based practices to improve student achievement.

4 Knowledge of developmentally appropriate curricula

1. Analyze and select developmentally appropriate curricula that provide for all areas of child development (i.e., physical, emotional, social, linguistic, aesthetic, cognitive).

2. Identify strategies for facilitating the development of literal, interpretive, and critical listening and thinking skills.

3. Determine activities that support the development of fine and gross motor skills.

4. Select and apply strategies, including the use of technology, for presenting instruction and concepts related to health, safety, and nutrition.

5. Select and apply strategies, including the use of technology, for presenting instruction and concepts related to visual arts, music, drama, and dance.

6. Select and apply strategies, including the use of technology, in developmentally appropriate ways to teach reading, mathematics, science, and social studies.

7. Select and apply strategies, including the use of technology, in developmentally appropriate ways to increase receptive and expressive vocabulary.

5 Knowledge of developmentally appropriate intervention strategies and resources available to meet the needs of all students

1. Select and analyze evidence-based instructional strategies to adapt curricula for children with diverse needs.

2. Identify characteristics of children with diverse needs in order to support their learning.

3. Identify and select resources and procedures that support children with diverse needs and their families.

4. Identify characteristics of children at risk for school failure and select appropriate intervention strategies for these children.

5. Identify major trends in educating children with exceptionalities and incorporate such trends in early childhood settings as appropriate.

6. Select and apply appropriate strategies for working with children who are in foster care and children who are migrant, transient, orphaned, or homeless.

7. Identify ways for accessing and appropriately using health information to monitor children's medical needs (e.g., medications for allergies) and/or other health impairments.

8. Identify needs for, and methods of, collaboration with other professionals in order to positively impact student learning.

9. Identify programs, curricula, and activities that address the language needs of children and their families with limited English proficiency.

6 Knowledge of diagnosis, assessment, and evaluation

1. Select and apply developmentally appropriate, reliable, and valid formal and informal screening, progress monitoring, and diagnostic instruments and procedures that measure specific characteristics.

2. Identify procedures for accurately establishing, maintaining, and using formal and informal student records.

3. Interpret formal and informal assessment data to make instructional decisions about the educational needs of children.

4. Identify procedures for appropriately using authentic assessments (e.g., portfolios, observations, journals) to plan instruction that further develops a child's level of learning and interest.

5. Identify procedures and legal requirements that provide for productive family conferences or home visits, regarding the assessment, education, and development of children, in accordance with due process (e.g., IEP, RtI) and confidentiality.

6. Identify methods of observing, facilitating, and extending children's play to practice newly acquired abilities (e.g., through problem solving, imitation, persistence, and creativity).

7. Identify different types of assessments (e.g., norm-referenced, criterion-referenced, diagnostic, curriculum-based) and the purposes of each.

8. Identify and apply appropriate processes for monitoring struggling students (e.g., RtI, tiered interventions) and planning and implementing intervention strategies.

7 Knowledge of child guidance and classroom behavioral management

1. Identify and analyze developmentally appropriate components of a positive and effective classroom behavioral management system.

2. Apply developmentally appropriate positive strategies for guiding children's behavior and responding to challenging behaviors.

3. Identify opportunities for promoting children's positive self-concept and self-esteem, prosocial skills, and social-emotional development through interaction with peers and familiar adults.

4. Select developmentally appropriate problem-solving strategies for conflict resolution, self-regulatory behavior, and social interaction.

5. Select and analyze appropriate strategies for teaching character development to young children.

6. Identify the roles of early childhood professionals in collaboration with other professionals (e.g., social workers, school counselors, community liaisons) in helping children and their families cope with stressors.

Prekindergarten/Primary PK–3
Subtest 2: Language Arts and Reading

1 Knowledge of literacy and literacy instruction

1. Identify the components of emergent literacy (i.e., oral and written language development, phonological awareness, letter knowledge, print concepts) and early literacy (i.e., phonemic awareness, phonics, fluency, vocabulary, comprehension).

2. Identify common emergent literacy difficulties and apply strategies for prevention, intervention, and remediation.

3. Apply evidence-based practices for developing emergent literacy (i.e., oral and written language development, phonological awareness, letter knowledge, print concepts) and early literacy (i.e., phonemic awareness, phonics, fluency, vocabulary, comprehension).

4. Identify appropriate, multisensory emergent and early literacy activities (e.g., literacy songs, manipulatives, Elkonin boxes).

5. Select specific evidence-based practices (e.g., group size, explicit, systematic, differentiated, individualized, corrective feedback) for developing emergent and early literacy.

6. Identify the components of and techniques for creating a print-rich environment to impact classroom instruction.

7. Analyze the components of a structured literacy program (e.g., phonemic awareness, phonics, fluency, vocabulary, comprehension).

8. Identify effective methods and strategies to integrate reading, writing, speaking, listening, viewing, and representing across the curriculum.

9. Determine effective techniques for motivating students to engage in academic and personal reading (e.g., setting reading goals, encouraging self-selection of texts).

2 Knowledge of literary and informational texts

1. Select a variety of texts that build background knowledge and language skills.

2. Identify and distinguish the elements of various literary genres and formats of prose and poetry (e.g., traditional literature, fantasy, realistic fiction).

3. Analyze and compare literature with common themes written from a variety of viewpoints.

4. Identify instructional approaches and apply strategies for developing literary analysis (e.g., story-mapping, plot structure, literary devices).

5. Select appropriate techniques for encouraging students to respond to literature and informational texts in a variety of ways (e.g., retelling, dramatizing, writing).

6. Identify a variety of uses and purposes for multiple representations of information (e.g., maps, graphic representations, print and nonprint media).

7. Identify evidence-based practices (e.g., activating background knowledge, questioning, summarizing) for facilitating students' reading comprehension across the curriculum.

8. Identify and use text structures (e.g., cause and effect, chronological order, compare and contrast) to develop students' comprehension.

9. Identify informational text features and their purposes (e.g., glossary, headings, table of contents) to develop students' comprehension.

10. Apply instructional approaches and strategies for teaching informational literacy skills (e.g., reference materials, research skills).

3 Knowledge of foundational reading skills

1. Identify appropriate stages of word recognition development and apply teaching strategies to guide students through these stages (i.e., pre-alphabetic, partial-alphabetic, full-alphabetic, consolidated alphabetic, automatic stages).

2. Identify effective word analysis strategies that skilled readers use in the decoding process (e.g., phonemic awareness, phonics).

3. Identify the components of reading fluency (i.e., accuracy, automaticity, rate, prosody) and apply evidence-based practices for developing reading fluency (e.g., practice with connected text, high-frequency words, timed repeated readings).

4. Select evidence-based practices and strategies for increasing vocabulary acquisition and development (e.g., tiered vocabulary, graphic organizers, morphemic and contextual analysis) across the curriculum.

5. Select and apply evidence-based practices for teaching essential comprehension skills (e.g., utilizing graphic organizers, activating background knowledge, developing content-specific vocabulary, asking questions).

6. Apply effective reading comprehension strategies (e.g., retelling, summarizing) for complex literary and informational texts

4 Knowledge of language elements used for effective oral and written communication

1. Distinguish among the developmental stages of writing (e.g., drawing, scribbling, letter-like formations, strings of letters).

2. Identify developmentally appropriate writing strategies for developing print concepts (e.g., directionality) and conventions (e.g., spelling, punctuation).

3. Determine the stages of the writing process (e.g., prewriting, editing, publishing).

4. Identify and distinguish characteristics of various modes of writing (e.g., narrative, expository, argumentative).

5. Select and analyze the appropriate mode of writing for a variety of occasions, purposes, and audiences, using textual support, reader response, and research as needed.

6. Apply strategies for conducting research and incorporating textual evidence into written communication using direct and indirect citation.

7. Identify developmentally appropriate strategies for enhancing writers' craft (e.g., supporting details, dialogue, transition words).

8. Determine effective strategies for comprehension and collaboration (e.g., following multiple-step directions, following group rules, participating in group discussions).

9. Identify key elements in students' presentations of ideas (e.g., visual and digital components, organization of ideas, clarity of thought).

10. Analyze the increasing complexity of conventions of English (e.g., common prepositions, personal and possessive pronouns, subject-verb agreement, regular and irregular plural nouns).

11. Compare characteristics and uses of formal and informal language (e.g., oral, written).

5 Knowledge of assessments to inform literacy instruction

1. Identify appropriate oral and written methods for assessing individual student progress in reading and writing (e.g., fluency probes, conferencing, rubrics).

2. Interpret and analyze data from informal and formal reading assessments using qualitative measures (e.g., reading behaviors) and quantitative measures (i.e., screening, progress monitoring, diagnosis, outcome measures) to guide differentiated instruction.

Prekindergarten/Primary PK–3
Subtest 3: Mathematics

1 Knowledge of number concepts and operations in base-10

1. Identify ordinal and cardinal numbers for a set.

2. Identify and apply number concepts (e.g., one-to-one correspondence, conservation of number after rearrangement) and various ways to count efficiently.

3. Apply concepts of place value to name, compare, round, and represent numbers in base-10 (e.g., 22 is two 10s and two 1s, one 10 and 12 1s, twenty-two 1s).

4. Apply concepts of addition, subtraction, multiplication, and division to solve problems involving multi- and single-digit whole numbers.

5. Identify and compare fractions (e.g., equivalent fractions, fractions greater than one, fractions with the same numerator or the same denominator) represented by visual fraction models, words, expressions of the form m/n, and number lines in mathematical and real-world contexts.

2 Knowledge of algebraic thinking

1. Identify numerical patterns (e.g., additive, multiplicative, repeating, extending) using a variety of methods (e.g., written descriptions, variables, tables, graphs).

2. Determine and apply concepts of equality and inequality in equations involving any of the four arithmetic operations (e.g., balancing and comparing quantities).

3. Solve multi-step mathematical and real-world problems involving whole number arithmetic operations with unknown values.

4. Apply properties of operations in whole number arithmetic (e.g., associative, commutative, distributive properties).

3 Knowledge of measurement, data collection, and analysis

1. Identify measurable attributes of figures and real-world objects using standard (i.e., metric and U.S. customary) and nonstandard (e.g., strings, paper clips) units to analyze quantities (i.e., length, perimeter, volume, temperature, time, and weight/mass).

2. Identify instructional activities for teaching concepts of time and money (e.g., determining the value of combinations of coins or currency, making change, determining elapsed time).

3. Select methods to collect, sort, organize, and represent data (i.e., tally marks, pictographs, tables, circle graphs, line plots, and scaled bar graphs), including data with fractional values.

4. Analyze whole number data to draw conclusions about a given data set.

4 Knowledge of geometry and spatial concepts

1. Identify and compare 2D figures (e.g., circles, rectangles, quadrilaterals, triangles, hexagons) and 3D figures (e.g., spheres, cones, cubes, prisms) according to defining attributes (e.g., number of sides or faces, lengths of sides or edges, straight or curved edges, parallel edges, right angle corners, lines of symmetry).

2. Solve problems involving the perimeter of triangles and quadrilaterals and the area of rectangles (e.g., decomposition of a complex figure into rectangles).

3. Identify spatial concepts and geometric vocabulary in mathematical and real-world situations.

5 Knowledge of student reasoning and instructional practices

1. Identify and apply strategies for building fluency with addition, subtraction, and multiplication of multi-digit whole numbers (e.g., visual models, partial sums and products, arrays and area models, compensation, inverse relationship between the four operations).

2. Analyze learning progressions to demonstrate how students' mathematical knowledge and skills develop over time among concrete, representational, and abstract modes of understanding.

3. Distinguish among the stages of students' mathematical fluency (i.e., exploration, procedural reliability, procedural fluency) to recognize the role played by automaticity in each of those stages.

4. Identify strategies to guide students in applying mathematics to real-world situations, including using mathematics in other subject areas at their grade level.

5. Select and analyze instructional methods and tools, including technology (e.g., interactive whiteboards, handheld technology) and manipulatives (e.g., base-10 blocks, fraction circles, pictorial representations) for small and large groups of students according to the cognitive complexity of a task and students' needs.

6. Identify and apply the use of mathematical thinking (e.g., use of patterns, structures, real-world contexts, multiple representations; assessing the reasonableness of solutions).

7. Analyze and interpret individual student mathematics assessment data (e.g., diagnostic, formative, progress monitoring, summative) to guide instructional decisions and differentiate instruction.

8. Identify and apply instructional methods to reinforce connections between mathematical topics within a grade level and the progression of mathematical topics from one grade level to the next.

9. Identify and apply appropriate instructional strategies for problem solving (e.g., drawing a picture, making a table, acting it out, writing an expression or equation).

Prekindergarten/Primary PK–3
Subtest 4: Science

1 Knowledge of effective science instruction

1. Analyze developmentally appropriate strategies for teaching science practices (e.g., observing, questioning, designing and carrying out investigations, developing and using models, constructing and communicating explanations).

2. Identify strategies and skills for facilitating children's experiences in ways that support their active inquiry, naturalistic exploration, talk and argument, and conceptual development.

3. Identify and analyze strategies for formal and informal learning experiences to provide science curriculum that promotes children's natural curiosity about the world (e.g., active hands-on experiences, active engagement in the physical world, student interaction).

4. Identify ways to organize and manage the early childhood classroom for safe, effective science teaching and learning (e.g., procedures, equipment, layout).

5. Identify and select developmentally appropriate formal and informal assessments to evaluate prior knowledge, to guide instruction, and to evaluate the impact of science experiences on student learning.

6. Select and analyze small- and large-group strategies to help students explain the concepts they are learning, provide opportunities to introduce formal science terms, and to clarify scientific concepts and misconceptions.

7. Select and apply safe and effective instructional strategies when using curricular and instructional tools and resources such as physical and conceptual models, scientific equipment, realia, and print and digital representations to support and enhance science instruction.

8. Apply scientifically and professionally responsible decision-making regarding the selection of socially and culturally sensitive science content and activities.

2 Knowledge of the nature of science

1. Identify and apply basic process skills (e.g., observing, inferring, classifying, measuring) and developmentally appropriate science practices (e.g., analyzing and interpreting data, constructing explanations, engaging in argument from evidence).

2. Evaluate and interpret pictorial representations, charts, tables, and graphs of authentic data from scientific investigations to make predictions, construct explanations, and support conclusions.

3. Analyze the dynamic nature of science as a way of understanding the world (e.g., tentativeness, replication, reliance on evidence).

4. Identify and select appropriate tools, including digital technologies, and units of measurement for various science tasks.

5. Evaluate the relationship between claims (e.g., including predictions), evidence (i.e., scientific knowledge, observations) and explanations (i.e., linking claims to evidence, drawing conclusions).

6. Identify and analyze attitudes and dispositions underlying scientific thinking (e.g., curiosity, openness to new ideas, appropriate skepticism, cooperation).

7. Identify and analyze ways in which science is an interdisciplinary process and interconnected to STEM disciplines (i.e., science, technology, engineering, mathematics).

8. Analyze considerations of science technology in society including cultural, ethical, economic, political, and global implications.

3 Knowledge of the earth and space sciences

1. Identify the living and nonliving composition of the Earth's surface and the properties of the nonliving materials that make up Earth's surface (e.g., soil, minerals, rocks, water).

2. Identify the processes that change the surface of the Earth.

3. Analyze the effects of the law of gravity on objects on Earth and in space.

4. Identify and distinguish distant objects seen in the daytime and nighttime sky (e.g., Sun, stars, planets, Moon).

5. Identify and analyze the causes and effects of atmospheric processes (e.g., weather, wind, water cycle).

6. Interpret and predict the direct and indirect effects of the Sun's energy on Earth, including plants, animals, water, land, and air.

7. Identify the components and significance of space research and exploration (e.g., timelines, tools and equipment, benefits and cost to society).

8. Identify and describe repeated patterns in the Sun-Earth-Moon system (e.g., the day-night cycle, phases of the Moon, seasons).

9. Analyze the impact of human activity on renewable and nonrenewable resources and natural events, including preparation for severe weather related events (e.g., hurricanes, tornadoes, flooding).

4 Knowledge of the physical sciences

1. Sort matter by its observable qualitative properties (e.g., shape, color, states, texture, hardness) and quantitative properties (e.g., mass, volume, temperature, weight, density).

2. Categorize matter as an element, compound, or mixture and compare the similarities and differences among them.

3. Identify and differentiate between physical and chemical changes in matter.

4. Identify and compare types, characteristics, and functions of energy.

5. Identify and analyze ways energy is transferred between objects or the surrounding air.

6. Analyze and compare the relationship between forces (e.g., push or pull) and an object's change in position, direction, and/or speed.

5 Knowledge of the life sciences

1. Identify how plants and animals respond to their environment.

2. Identify basic concepts of heredity (e.g., why offspring resemble their parents).

3. Classify plants and animals into major groups according to characteristics (e.g., physical features, behaviors, development).

4. Compare the ways living things meet their basic needs through interaction with and dependence on one another when sharing an environment (e.g., competition, predation, pollination).

5. Identify basic characteristics of living and nonliving things.

6. Identify and describe the basic structures, behaviors, and functions of plants and animals that allow them to carry out their life processes (e.g., grow, reproduce, and survive).

7. Identify and compare the structure and functions of major systems of the human body.

8. Identify and compare the predictable ways plants and animals change as they grow, develop, and age.

9. Identify and compare processes of sexual and asexual reproduction in plants, animals, and microorganisms.

10. Identify the variety of habitats within ecosystems and analyze how they meet the needs of the organisms that live there.

Preschool Education (Birth–Age 4)

Section 07

Preschool Education (Birth–Age 4)

1 Knowledge of typical and atypical early childhood development

1. Differentiate among the developmental domains (e.g., physical, cognitive, language, social-emotional).
2. Identify the developmental sequences and milestones for the typically developing child.
3. Identify indicators of atypical development.
4. Identify and evaluate the major influences of genetics, environment, health, nutrition, socioeconomics, family, community, and culture on child development.
5. Determine prenatal, perinatal, and postnatal factors that place a child at risk for developmental delay or disability.

2 Knowledge of early childhood foundations, standards, and professional practices

1. Identify the major historical theorists and theories in the field of early childhood education and their implications for practice.
2. Identify state, federal, and national standards, policies, and laws for early care and education.
3. Identify state, federal, and national programs and organizations that provide services for young children and their families.
4. Identify professional organizations, research publications, and activities in all fields of early childhood education, including early intervention.
5. Apply the roles, responsibilities, and ethical conduct of early care and education professionals.
6. Analyze contemporary trends and issues in early care and education.

3 Knowledge of issues and practices for engaging culturally diverse families and communities

1. Apply culturally responsive strategies and resources to ensure fair and equitable practices with children and families.
2. Identify frameworks and apply culturally responsive practices for encouraging, facilitating, and incorporating family and community engagement in all aspects of early care and education.
3. Differentiate among appropriate strategies for working with diverse family structures, values, and patterns of interactions.

4. Determine barriers that may limit family access to high quality care or services.

5. Analyze barriers that impact family and community engagement.

6. Apply practices for incorporating family concerns, priorities, and resources as they relate to the young child.

7. Identify resources and strategies for collaborating with program-based and community professionals to support children and their families.

8. Apply appropriate strategies for supporting the primary relationship between the family and the young child.

9. Determine appropriate practices for facilitating the transitions of children and their families.

4 Knowledge of curriculum and developmentally appropriate practice

1. Differentiate among curriculum models.

2. Identify and apply the characteristics of an integrated curriculum.

3. Apply strategies for planning short- and long-term goals to support the development of the whole child.

4. Apply appropriate practices for using technology as a resource to support children's interests and exploration.

5. Apply appropriate practices that promote creative, aesthetic, and active learning through visual and expressive arts (e.g., music, movement, drama).

6. Apply appropriate practices to support adaptive skills and promote physical development.

7. Apply appropriate practices to support the development of early and emergent literacy, language acquisition, and communication skills for all children, including English language learners.

8. Apply appropriate practices that promote active learning through play, such as independent exploration, discovery, and multisensory involvement.

9. Apply appropriate practices that support the development of critical thinking and problem-solving skills, knowledge of cause-and-effect relationships, and ability to predict outcomes.

5 Knowledge of developmentally appropriate learning environments

1. Analyze plans for appropriate organization of indoor and outdoor space, equipment, and materials to create an environment that supports the development of the whole child.

2. Apply appropriate practices that provide a creative, engaging, and culturally-responsive, play-based environment.

3. Differentiate among appropriate practices that accommodate socioeconomic factors, diverse cultures and languages, learning styles, multiple intelligences, and varying ability or skill levels.

4. Determine appropriate schedules, rituals, and routines for all learners.

5. Apply practices that promote effective teacher-child interactions.

6 Knowledge of developmentally appropriate guidance that supports the self-regulation and social-emotional development of young children

1. Determine factors (e.g., temperament, culture) that influence a child's emotional response to people, events, and situations.

2. Apply developmentally appropriate and culturally-responsive practices for guiding and responding to children's behavior.

3. Apply strategies to support the development of initiative and intrinsic motivation in children.

4. Apply strategies that facilitate the collaboration of family, community resources, and early childhood personnel to support children's social and emotional well-being.

5. Apply appropriate and culturally responsive practices that build nurturing relationships between the child, peers, and caregivers.

6. Apply appropriate practices to support self-regulation and promote pro-social behavior in young children.

7 Knowledge of children with varying exceptionalities and special considerations and the impact on families

1. Identify early intervention services and programs designed to meet the needs of families and children with exceptionalities and special considerations (e.g., homelessness).

2. Identify the components of Parts B and C of the Individuals with Disabilities Education Act (e.g., service coordination, eligibility) including procedural safeguards and due process.

3. Differentiate among common types of disabilities and disorders, their causes, characteristics, and effects on the child, family, and community.

4. Identify appropriate screening and referral processes for children who may have exceptionalities and special considerations.

5. Apply strategies to assure access for inclusion of children with exceptionalities in least restrictive and natural environments.

6. Analyze practices for adapting the environment and curriculum to support meaningful participation of children with exceptionalities in inclusive settings.

7. Identify the components and apply strategies and procedures for developing and implementing an IFSP or IEP using a collaborative team approach.

8 Knowledge of developmentally appropriate screening, assessment, and evaluation

1. Distinguish among the types and purposes of appropriate screening, assessment, and evaluation of all young children.

2. Apply formal and informal assessment strategies to guide educational decisions.

3. Interpret assessment data to identify appropriate intervention, remediation, enrichment, or need for further evaluation.

4. Analyze data to evaluate the effectiveness of teaching and learning practices.

5. Differentiate among approaches for involving all families in assessment processes.

9 Knowledge of health, safety, and nutrition

1. Identify the types and symptoms of common childhood diseases and health concerns.

2. Apply universal precautions for disease prevention and control.

3. Apply procedures to facilitate the safety of young children.

4. Identify indicators of and apply procedures for reporting child abuse and neglect.

5. Apply strategies that promote wellness through healthy living and nutrition for all children and their families.

Reading
K–12

Section 35

Reading K–12

1 Knowledge of research and theories of reading processes

1. Identify characteristics and sources of reading research that is evidence based.
2. Identify foundational theorists and differentiate among theories of reading processes and development.
3. Distinguish theories of reading processes and development as they relate to instructional applications.

2 Knowledge of text types and structures

1. Apply methods for instructing students to use text structures and text features to assist in understanding literary and informational texts.
2. Differentiate among the characteristics, features, and elements of various literary and informational texts and formats of texts for reading and writing.
3. Evaluate and select appropriate texts to reflect and support the backgrounds of all learners while matching texts to student interest.
4. Determine criteria for evaluating and selecting both print and nonprint texts for instructional use.
5. Evaluate and select texts at appropriate grade levels and complexity for all learners using qualitative, quantitative, and student-centered components of text complexity.

3 Knowledge of reading assessment and evaluation

1. Differentiate among characteristics of norm-referenced and criterion-referenced assessments, including performance-based assessments, used for screening, diagnosis, progress monitoring, and other outcome measures.
2. Evaluate and select appropriate oral and written assessment instruments and practices for monitoring individual student progress.
3. Analyze and interpret data from multiple informal and formal reading and writing assessments to inform small-group instruction.
4. Analyze and interpret data from multiple informal and formal reading and writing assessments to inform whole-group instruction.
5. Analyze and use student data from multiple informal and formal reading and writing assessments to inform flexible groupings, differentiate instruction, and develop individual student goals for all learners.

4 Knowledge of learning environments and procedures that support reading

1. Apply appropriate grouping practices for specific instructional purposes in reading.

2. Determine appropriate procedures and delivery methods to integrate speaking and listening, reading, writing, and viewing for all learners across content areas.

3. Evaluate and select evidence-based practices to motivate all learners toward academic and personal reading.

4. Identify technology that incorporates evidence-based practices to support student-centered learning and establish an information-rich environment.

5. Determine organizational structures (e.g., whole group, small group, individualized) and classroom management practices to support implementation of evidence-based practices for all learners.

6. Evaluate and select methods of evidence-based intervention for students who have not mastered grade-level English Language Arts Standards.

5 Knowledge of oral and written language acquisition and reading and writing development

1. Identify and apply the concepts related to oral language acquisition.

2. Identify and apply the concepts related to written language acquisition.

3. Identify and apply evidence-based practices grounded in the science of reading to develop students' reading and writing skills.

4. Apply evidence-based practices for developing narrative, argumentative, and expository writing.

5. Apply evidence-based practices for developing oral and written language, phonological awareness, print concepts, alphabet knowledge, decoding skills, fluency, vocabulary, and comprehension.

6 Knowledge of phonological awareness, phonics, and word recognition based on the science of reading

1. Identify the concepts related to phonological awareness and word-recognition development.

2. Apply evidence-based practices for developing phonemic awareness for all learners.

3. Apply evidence-based practices for developing phonics knowledge and decoding skills for all learners.

4. Apply evidence-based practices for developing word-analysis skills for decoding and encoding monosyllabic and multisyllabic words for all learners.

5. Apply evidence-based practices for teaching high-frequency words, sight words, temporarily irregular words, and irregular words for all learners.

7 Knowledge of vocabulary acquisition and use based on the science of reading

1. Identify the concepts of vocabulary acquisition and use, such as the use of context and connotations, morphology, and background knowledge to determine the meaning of unknown words.

2. Evaluate and select evidence-based practices for vocabulary acquisition and use in speaking and listening, reading, and writing for all learners.

3. Apply appropriate evidence-based practices for developing the use of independent word-learning strategies for all learners, such as the use of context and connotations, morphology, and background knowledge to determine the meaning of unknown words.

4. Apply evidence-based practices for developing all learners' ability to use conversational, academic, and domain-specific words and phrases.

8 Knowledge of reading fluency and reading comprehension based on the science of reading

1. Identify the components of reading fluency that support comprehension.

2. Apply evidence-based practices for developing fluent reading and comprehension.

3. Evaluate and select evidence-based practices for teaching skills and developing strategies for comprehension and analysis of informational texts.

4. Evaluate and select evidence-based practices for teaching skills and developing strategies for comprehension and analysis of literary texts.

5. Apply evidence-based practices for developing metacognition (e.g., making and confirming predictions, asking questions, inferring, summarizing, paraphrasing) and critical thinking for all learners.

6. Apply evidence-based practices for engaging students in collaborative, text-based discussions about literary and informational print and nonprint texts.

9 Knowledge of reading program development, implementation, and coordination

1. Evaluate and select approaches for involving stakeholders, including caregivers, in reading initiatives and education for all learners.

2. Interpret reading policies, program information, and assessment data for dissemination among stakeholders.

3. Evaluate instructional materials for comprehensive reading programs and reading intervention programs for all learners.

4. Identify criteria to determine the effectiveness of reading programs.

5. Interpret reading data and program evaluation results to modify and improve curricular content and instruction through professional learning.

6. Determine effective methods for directing, supporting, or collaborating with professionals, paraprofessionals, tutors, and volunteers to assist in reading instruction for all learners.

School Counseling
PK–12

Section 18

School Counseling PK–12

1 Knowledge of counseling

1. Apply evidence-based counseling theories and techniques in the school setting (e.g., Adlerian, rational emotive behavior, cognitive behavioral, solution focused, person centered, family system, choice).

2. Analyze the ways in which identity, personality, learning, and human development theories are embedded in counseling theories.

3. Apply counseling theories and techniques that are evidence-based, relevant, and appropriate to specific situations and populations, including how to modify counseling techniques to meet the needs of diverse groups and populations.

4. Determine criteria for selecting appropriate modes of counseling interventions in individual, small-group, and classroom settings.

5. Analyze therapeutic factors, processes, procedures, and stages in counseling groups.

6. Apply listening, responding, and leadership skills for facilitating small and large groups, including classroom management, with students and other stakeholders.

2 Knowledge of programs and interventions for addressing current issues in schools

1. Apply evidence-based strategies that promote academic, career, and social-emotional student competencies.

2. Apply principles and practices of crisis planning and response (e.g., responses to death, natural disasters, acts of violence, medical emergencies, trauma).

3. Analyze and apply preventative programs (e.g., drug education, personal safety, bullying) and appropriate interventions to address high-risk student behaviors within a comprehensive school counseling program.

4. Apply principles and practices of peer helper programs (e.g., peer mediation, peer tutoring, peer mentoring, peer leadership).

5. Interpret the components and themes that comprise the *ASCA National Model: A Framework for School Counseling Programs* (e.g., foundation, management, delivery, accountability, systemic change, collaboration, advocacy, leadership) and how these elements contribute to an effective comprehensive school counseling program.

3 Knowledge of assessment in promoting student success

1. Apply basic measurement concepts (e.g., validity, norming, reliability, error of measurement, standardization) in school counseling contexts.

2. Analyze factors that influence student performance and affect test results and ways to address these factors in a comprehensive school counseling program.

3. Analyze the major functions, strengths, and limitations of various standardized and nonstandardized assessments.

4.

5. Apply concepts related to formal and informal assessments and the use of assessment results to promote systemic change and student success.

6. Apply effective methods for gathering and synthesizing data from a variety of sources (e.g., response to intervention/multi-tiered system of supports, student information system) for a comprehensive assessment of a student and appropriate methods for communicating data to others.

7. Apply procedures for the ethical and responsible use of formal and informal assessment results from a variety of sources to improve student educational outcomes.

4 Knowledge of career development and postsecondary opportunities

1. Analyze principles of prominent career development theories and resources, including assessments, used in career development.

2. Apply school counseling strategies and activities that address students' college and career readiness across developmental levels, including decision-making approaches for students in various stages of career development.

3. Apply procedures of formal and informal career assessments and data-driven methods for evaluating students' college and career readiness.

4. Apply appropriate college and career readiness counseling interventions and schoolwide approaches across levels (e.g., elementary, middle, secondary) that promote lifelong learning and career success.

5. Compare and contrast resources that provide students with specific information about postsecondary and career and technical educational opportunities and sources of financial assistance.

6. Apply counseling interventions to address the challenges experienced by diverse populations of students (e.g., first-generation college students, ELLs, students of low socioeconomic status, undocumented students, adjudicated students).

5 Knowledge of consultation, collaboration, and coordination

1. Analyze components essential to a school-based consultation model, including consultation strategies appropriate for diverse populations.

2. Apply strategies, procedures, and processes for collaborating with stakeholders and using data, resources, and technology to create learning environments that promote educational equity, success, and well-being for every student.

3. Apply appropriate procedures and follow-up strategies for student transitions (e.g., grade level, change of placement, school transfer).

4. Apply methods for communicating with stakeholders, including teachers, parents or guardians, administrators, district personnel, and community partners, to explain the benefits of a comprehensive school counseling program and share relevant information.

5. Apply methods for accessing school and community resources to make appropriate in-school and out-of-school referrals.

6. Apply effective methods and skills (i.e., multicultural, ethical, and professional) for coordinating with stakeholders in the implementation of a comprehensive school counseling program.

6 Knowledge of professional, ethical, and legal considerations

1. Analyze the history and foundations of the school counseling profession.

2. Apply legal standards relevant to the school counseling process and practices.

3. Apply professional and ethical standards and position statements of the American School Counselor Association.

4. Interpret the legal rights of students and parents or guardians with regard to student records (e.g., Family Educational Rights and Privacy Act, Health Insurance Portability and Accountability Act, Individuals with Disabilities Education Improvement Act, Section 504).

5. Interpret federal and state legislation concerning students with disabilities, undocumented students, and students who are homeless.

6. Apply strategies related to the counselor's role as an advocate and leader to promote and support educational equity, inclusiveness, and student success in the school and community.

7 Knowledge of individual student planning

1. Apply effective strategies for promoting awareness of graduation requirements, application and admission processes for various postsecondary options, and financial resources (e.g., FAFSA, Florida Financial Aid Application) for all students and families.

2. Interpret academic assessment data for appropriate educational placement and progression for all student populations.

3. Apply principles and practices for assisting all students with curriculum paths to effectively prepare for secondary and postsecondary educational or employment opportunities.

4. Apply systemic practices that foster equity and access for every student.

8 Knowledge of the development and evaluation of exemplary comprehensive school counseling programs

1. Apply accountability methods implemented in a comprehensive school counseling program based on the American School Counselor Association model and the school counselor-principal agreement.

2. Analyze needs assessment techniques, various types of data (e.g., process, perception, outcome), and their role in driving program goals and objectives for a comprehensive school counseling program.

3. Analyze the purposes, types, and basic steps of program evaluation and relevant follow-up activities, including the collection and evaluation of data related to a comprehensive school counseling program.

4. Apply strategies for progress monitoring and for sharing program outcomes (e.g., curriculum results, small-group results, closing-the-gap reports) with all stakeholders to effect systemic change.

5. Apply effective methods for disseminating materials and resources to all stakeholders as part of a comprehensive school counseling curriculum.

6. Apply practices for identifying and closing achievement, attendance, behavior, resource, opportunity, and informational gaps.

9 Knowledge of technology and digital citizenship

1. Apply appropriate use of technology in supporting student learning and development.

2. Apply appropriate use of technology for managing, storing, and reporting student data.

3. Apply appropriate use of technology in planning, organizing, delivering, and evaluating a comprehensive school counseling program.

4. Analyze legal, ethical, and cultural considerations of technological applications (e.g., confidentiality, security, privacy, communication practices, use of social media, virtual counseling).

5. Apply strategies for educating students about appropriate and responsible use of technology and the principles of digital citizenship.

6. Analyze current trends in technology and the impact on learning and development.

10 Knowledge of cultural competence for school counselors

1. Analyze multicultural, pluralistic, and social justice matters when creating school counseling initiatives and developing program goals and objectives.

2. Analyze the characteristics, needs, and concerns of culturally diverse populations.

3. Apply methods for developing and delivering culturally responsive curriculum and services for diverse students and families.

4. Analyze the counselor's ethical responsibility to identify and address their own biases.

5. Apply multicultural and social justice theories, inclusive strategies, and language that eliminates biases, prejudices, and discriminatory contexts within the school and community.

6. Apply social justice strategies for advocating against oppressive systemic barriers and leading initiatives to promote a positive and safe school climate for all students.

School Psychologist
PK–12

Section 36

School Psychologist PK–12

1 Knowledge of statistics, research methods, and program evaluation

1. Apply theories and practices of measurement and test construction (e.g., standards for evidence of reliability and validity).

2. Apply knowledge of statistical concepts and terms.

3. Analyze principles of research design (e.g., single subject, qualitative, quantitative, program evaluation).

4. Analyze and apply research findings from psychoeducational studies in various school psychology contexts.

2 Knowledge of data-based decision making and accountability

1. Analyze characteristics of data collection methods (e.g., checklists, records review, assessments, interviews, behavioral observations, curriculum-based measurement) used in the comprehensive problem-solving and evaluation processes.

2. Determine appropriate data collection methods, materials, and procedures necessary to assess student, group, and school-level needs and outcomes.

3. Apply appropriate methods for progress monitoring individual, group, school-level, and district-level outcomes.

4. Apply instruments and methods of psychoeducational assessment that consider the needs of specialized populations (e.g., early childhood, students with low-incidence disabilities).

5. Interpret and apply data gathered using multiple methods and informants to make recommendations regarding educational decision making.

6. Apply appropriate data collection practices and assessments that are sensitive to the various needs of students who are culturally, ethnically, and linguistically diverse, including students from populations that may be marginalized.

3 Knowledge of child and adolescent development

1. Apply theories of cognitive and intellectual development.

2. Apply theories of language, perceptual, and sensorimotor development.

3. Apply theories of personality and social-emotional development.

4. Apply principles of learning, memory, and motivation.

5. Analyze developmental patterns of disorders in childhood and adolescence.

6. Apply major theories of child and adolescent development to the professional practice of school psychology.

4 Knowledge of curricula and evidence-based interventions and instructional strategies related to academic outcomes

1. Assess components of standards-based curricula, engaging instructional environments, and effective evidence-based instruction.

2. Apply concepts related to the development of reading, mathematics, and written and oral language skills.

3. Apply appropriate, evidence-based instructional strategies for reading, mathematics, and written and oral language.

4. Apply evidence-based screening, prevention, and intervention methods supported by analysis of ongoing progress monitoring to address academic concerns.

5. Apply appropriate problem-solving methods in various educational contexts, including evaluating the fidelity, implementation, response to, and effectiveness of academic interventions.

5 Knowledge of biological, social, and cultural bases of learning, behavior, and mental health

1. Analyze systemic social, environmental, cultural, linguistic, and ethnic factors that influence learning, behavior, and mental health.

2. Analyze individual experiential, instructional, environmental, biological, and medical factors that influence learning, behavior, and mental health.

3. Analyze social, environmental, cultural, linguistic, ethnic, and instructional factors that influence language development.

4. Apply concepts related to functions of the brain, such as self-regulation, self-monitoring, planning/organization, empathy, and healthy decision making.

6 Knowledge of evidence-based interventions and instructional strategies related to social-emotional, mental, and behavioral health outcomes

1. Apply knowledge of risk and protective factors to support positive and engaging school climates and cultures.

2. Apply appropriate, evidence-based universal screening to guide prevention and intervention strategies for schoolwide social-emotional, mental, and behavioral health concerns.

3. Apply appropriate, evidence-based prevention and intervention strategies through a continuum of supports for social-emotional, mental, and behavioral health concerns, including knowledge of social-emotional learning components.

4. Apply problem-solving methods and evaluate the fidelity of implementation and response to and effectiveness of social-emotional, mental, and behavioral health interventions.

5. Identify components and analyze techniques of applied behavior analysis.

6. Apply theories and techniques of individual and group counseling in a continuum of social-emotional learning and mental and behavioral health supports and interventions.

7 Knowledge of best practices in student and school safety

1. Interpret the signs, symptoms, and impact of mental health disorders, including substance abuse.

2. Interpret the signs, symptoms, and impact of traumatic events to guide trauma informed practices.

3. Identify the signs, symptoms, and impact of abuse.

4. Apply schoolwide screening, prevention, and intervention methods that address issues related to school climate (e.g., truancy, bullying, violence, suicide).

5. Apply techniques for threat and suicide assessment, prevention, and intervention.

6. Apply strategies related to stages of crisis prevention and intervention.

8 Knowledge of consultation, collaboration, and problem solving

1. Apply appropriate theories and methods of consultation and collaboration with school professionals and other specialists in the community.

2. Apply steps in the problem-solving process.

3. Apply methods of consultation and collaboration to address academic, mental, behavioral, and social-emotional concerns.

4. Apply appropriate theories and methods for engaging in systems-level (e.g., school, district, state) problem solving and consultation.

5. Apply appropriate theories and methods for collaborating with parents or guardians and increasing home-school collaboration and consultation.

9 Knowledge of ethical, legal, and professional practice of school psychology

1. Identify elements of the organizational and operational structures of public schools.

2. Interpret historical foundations and important trends in the development of the profession of school psychology.

3. Apply professional standards of best practices in school psychology.

4. Apply the guidelines for professional conduct as stated in the ethical codes of the FASP, NASP, and American Psychological Association, and in the Code of Ethics of the Education Profession in Florida.

5. Apply ethical decision-making processes.

6. Examine social justice issues impacting public education and the profession of school psychology.

10 Knowledge of laws, rules, regulations, court decisions, and procedures related to public education

1. Apply federal and state rules, regulations, and policies related to the practice of school psychology and public education.

2. Analyze the implications of landmark court decisions related to the practice of school psychology.

3. Analyze the characteristics of various exceptionalities and disabilities (e.g., gifted, specific learning disabilities, sensory impairments).

4. Apply appropriate procedures and assessment data to support educational decision making for students with exceptionalities and disabilities.

5. Apply federal and state mandated procedures in the development of an EP, an IEP and a Section 504 accommodation plan.

6. Apply federally required disciplinary policies and procedures (e.g., manifestation determination) for students eligible for protection under IDEA and ADA.

Social Science
6–12

Section 37

Social Science 6–12

1 Knowledge of geography

1. Apply the six essential elements of geography.

2. Identify the ways natural processes and human-environment interactions shape the Earth's physical systems and features.

3. Identify the ways natural processes and human-environment interactions shape cultural features (e.g., communities, language, technology, political and economic institutions).

4. Analyze geographic information from maps, charts, and graphs.

2 Knowledge of economics

1. Analyze how scarcity and opportunity cost influence choices about how to allocate resources.

2. Identify how economic systems (e.g., market, command, traditional) answer the three basic economic questions.

3. Analyze the interaction of supply and demand in determining production, distribution, and consumption.

4. Analyze how macroeconomic factors (e.g., national income, employment, price stability) influence the performance of economic systems.

5. Evaluate the roles of government, central banking systems, and specialized institutions (e.g., corporations, labor unions, banks, stock markets) in market and command economies.

6. Analyze the features of global economics (e.g., exchange rates, terms of trade, comparative advantage, less developed countries) in terms of their impact on national and international economic systems.

7. Evaluate the functions of budgeting, saving, and credit in a consumer economy.

3 Knowledge of political science

1. Identify the features and principles of the U.S. Constitution, including its amendments, the separation of powers, checks and balances, and federalism.

2. Identify the functions of U.S. political institutions, including the executive, legislative, and judicial branches.

3. Identify the effects of voter behavior, political parties, interest groups, public opinion, and mass media on the electoral process in the United States.

4. Identify the elements and functions of state and local governments in the United States.

5. Analyze the guiding concepts, principles, and effects of U.S. foreign policy.

6. Compare various political systems in terms of elements, structures, and functions.

7. Analyze the key elements of U.S. citizenship, including rights, privileges, and responsibilities.

4 Knowledge of world history

1. Identify characteristics of prehistoric cultures and early civilizations (e.g., Mesopotamian, Egyptian, Indus Valley, Chinese).

2. Evaluate the influence of ancient civilizations (e.g., Greek, Roman, Indian, Chinese) on the evolution of modern civilization.

3. Identify the major contributions of African, Asian, and Mesoamerican societies before 1500.

4. Identify the major contributions of the Middle Ages, the Renaissance, and the Reformation period to Western civilization.

5. Identify the social, cultural, political, and economic characteristics of African, Asian, and eastern European societies from 1500 to 1900.

6. Evaluate the significant scientific, intellectual, and philosophical contributions of the Age of Reason through the Age of Enlightenment.

7. Identify the causes, effects, events, and significant individuals associated with the Age of Exploration.

8. Assess the social, political, and economic effects of the Industrial Revolution.

9. Identify the causes, effects, events, and significant individuals associated with the Age of Revolution.

10. Evaluate the impact of imperialism and nationalism on global social, political, geographic, and economic development.

11. Analyze the causes and effects of political transformations and military conflicts in the 20th century.

12. Analyze major contemporary global political, social, economic, and geographic issues and trends.

13. Identify major world religions and ideologies.

5 Knowledge of U.S. history

1. Evaluate the impact of the Age of Exploration on the Americas.

2. Analyze the social, cultural, political, and economic development of the Americas during the colonial period.

3. Identify the causes, significant individuals, and effects of the events associated with the Revolutionary era.

4. Identify the causes, significant individuals, and effects of the events associated with the Constitutional era and the early republic.

5. Evaluate the impact of westward expansion on the social, cultural, political, and economic development of the emerging nation.

6. Identify the social, cultural, political, and economic characteristics of the antebellum period.

7. Identify the causes, significant individuals, and effects of the events associated with the American Civil War and Reconstruction eras.

8. Evaluate the impact of agrarianism, industrialization, urbanization, and reform movements on social, cultural, political, and economic development in the late 19th and early 20th centuries.

9. Evaluate the impact of immigration on social, cultural, political, and economic development in the late 19th and early 20th centuries.

10. Identify the causes, significant individuals, and effects of the events associated with the World War I era.

11. Identify social, cultural, political, and economic developments (e.g., Roaring Twenties, Harlem Renaissance, Great Depression, New Deal) between World War I and World War II.

12. Identify the causes, significant individuals, and effects of the events associated with the World War II era.

13. Identify the causes, significant individuals, and effects of the events associated with domestic and foreign affairs during the Cold War era.

14. Identify the causes, significant individuals, and effects of the events associated with movements for equality, civil rights, and civil liberties in the 19th and 20th centuries.

15. Identify the causes, significant individuals, and effects of the events associated with contemporary domestic and foreign affairs.

16. Identify key individuals, events, and issues related to Florida history.

6 Knowledge of social science and its methodology

1. Identify social science disciplines (e.g., anthropology, psychology, sociology).

2. Identify social science concepts (e.g., culture, class, technology, race, gender).

3. Analyze the interrelationships between social science disciplines.

4. Interpret tabular and graphic representations of information related to the social sciences.

5. Identify appropriate strategies, methods, tools, and technologies for the teaching of social science.

6. Evaluate examples of primary (e.g., letters, photographs, political cartoons) and secondary (e.g., historical texts, encyclopedias) sources.

Spanish
K–12

Section 39

Spanish K–12

1 Proficiency in presentational and interpersonal modes of communication (Speaking)

1. Give a series of classroom instructions.
2. Narrate, describe, or explain using a variety of moods and tenses.
3. Express and defend an opinion.
4. Communicate on topics relating to personal interests, academic disciplines, or global issues.
5. Respond to situations of everyday life (e.g., make requests, obtain information, seek assistance).

2 Proficiency in presentational and interpersonal modes of communication (Writing)

1. Demonstrate the ability to write in an organized and logical manner on a specific topic (e.g., global issues, family, travel) using details and examples to support ideas.
2. Use appropriate register, vocabulary choice, tone, and idiomatic expressions for a specified audience and purpose.
3. Demonstrate mastery of spelling, structure, and punctuation.

3 Proficiency in interpretive listening

1. Demonstrate comprehension of authentic broadcasts on everyday topics and current events.
2. Demonstrate comprehension of authentic conversations of a routine social nature concerning everyday topics and current events.
3. Demonstrate comprehension of the essential points of a discussion or speech on a topic in a specific field of interest.
4. Demonstrate comprehension of verbal instructions.

4 Proficiency in interpretive reading

1. Demonstrate comprehension of written material on a familiar topic (e.g., sports, travel, movies, theatre, food, music).
2. Demonstrate comprehension of authentic articles on current topics and official documents.
3. Identify main ideas and key details in written sources.

4. Make inferences and predictions from written sources.

5 Knowledge of practices, products, and perspectives of Spanish-speaking cultures

1. Demonstrate general knowledge of practices of Spanish-speaking cultures (e.g., social behavior, customs, traditions), including how they are influenced by geography and history.

2. Demonstrate general knowledge of products of Spanish-speaking cultures (e.g., social, political, and economic systems), including how they are influenced by geography and history.

3. Demonstrate general knowledge of perspectives of Spanish-speaking cultures (e.g., beliefs, values), including how they are influenced by geography and history.

6 Knowledge of language structure

1. Determine the correct usage of verb conjugations and tense or mood selection.

2. Determine the correct usage of interrogatives (e.g., *qué* vs. *cuál*, *cómo* vs. *qué*, *dónde* vs. *adónde*).

3. Determine the correct usage of prepositions (e.g., *por*, *para*, *en*, *a*).

4. Determine the correct usage of verb pairs that have similar meanings in English (e.g., *ser* vs. *estar*, *saber* vs. *conocer*, *pedir* vs. *preguntar*, *tocar* vs. *jugar*).

5. Determine correct agreement (e.g., gender, number, subject-verb).

6. Determine the correct usage of pronouns (e.g., subject, object, reflexive).

7. Determine the correct usage of adjectives (e.g., shortened, position, comparative, superlative, demonstrative).

8. Determine the correct usage of definite and indefinite articles.

9. Determine correct word usage and syntax.

7 Knowledge of effective teaching and learning strategies based on second language acquisition principles

1. Identify and apply research-based theories and practices of language acquisition instruction (e.g., immersion, affective filter, comprehensible input).

2. Determine effective instructional strategies (e.g., cooperative learning, use of realia, interdisciplinary approaches, total physical response, project-based teaching, scaffolding) for promoting student proficiency in interpersonal, interpretive, and presentational modes of communication.

3. Determine effective strategies for actively promoting cultural competency through Spanish-language instruction.

4. Determine effective strategies for meeting the needs of diverse Spanish-language learners.

5. Determine effective applications of technology and resources to facilitate Spanish-language acquisition.

6. Determine a variety of assessment tools for monitoring student progress, achievement, and learning gains in the three modes of communication (i.e., interpersonal, interpretive, and presentational).

7. Interpret learning outcomes and assessment results to adjust instruction and facilitate the learning process.

Speech-Language Impaired
K–12

Section 42

Speech-Language Impaired K–12

1 Knowledge of philosophical, historical, and legal foundations of communication and swallowing disorders and their impact on the education of students

1. Identify and interpret philosophical bases and historical theories of educational and therapeutic practices.

2. Interpret and apply the philosophical bases and historical theories of speech and language acquisition and development.

3. Identify and apply the major components of federal and state regulations related to students with communication and swallowing disorders.

2 Knowledge of typical and atypical communication and swallowing processes and development

1. Distinguish physiological, neurological, and anatomical components of the speech, language, hearing, and swallowing mechanisms.

2. Identify and apply the characteristics of typical development of speech production (e.g., fluency, articulation, phonological processes, and voice), oral and written language (e.g., literacy, pragmatics, phonology, morphology, syntax, semantics, and cognition), and swallowing (e.g., educational impact and safety of feeding and swallowing).

3. Differentiate among communication disorders and communication differences.

4. Differentiate characteristics of communication and swallowing disorders.

3 Knowledge of culturally- and linguistically-responsive evaluation processes for students served in the school population

1. Identify terminology and apply principles of assessment.

2. Select evidence-based procedures to assess communication to include speech production (e.g., fluency, articulation, phonological processes, and voice), oral and written language (e.g., literacy, pragmatics, phonology, morphology, syntax, semantics, and cognition), and swallowing (e.g., educational impact and safety of feeding and swallowing).

3. Interpret multiple sources of data to make recommendations, plan for treatment, and monitor progress as it relates to student performance.

4. Select appropriate content and methods to communicate assessment information to students, families, professionals, related service personnel, and community agencies.

4 Knowledge of culturally- and linguistically-responsive service delivery techniques for students served in the school population

1. Apply evidence-based practices and strategies for use from prevention through treatment of communication and swallowing disorders.

2. Identify and apply appropriate accommodations, assistive technology, and strategies to promote independent communication in various settings.

3. Determine educationally relevant IEP goals and objectives to address communication and swallowing deficits.

4. Identify and apply a continuum of service delivery models for diverse student needs and settings.

5. Identify appropriate and effective collaboration and advocacy strategies with students, families, professionals, related service personnel, and community agencies to maximize outcomes.

5 Knowledge of ethics and professional scope of practice

1. Identify and apply ethical behaviors and practices for speech-language pathologists using the highest level of professional competence and performance.

2. Identify and differentiate among the roles and responsibilities of speech-language pathologists in the school setting.

3. Identify and apply strategies to advocate for students and the profession.

Visually Impaired
K–12

Section 44

Visually Impaired K–12

1 Knowledge of philosophical, historical, and legal foundations regarding students with visual impairments

1. Identify key philosophical, historical, and legal foundations of education of students with visual impairments, including deafblindness.

2. Identify state and federal laws, rules, regulations, and policies related to the field of special education and their application to the field of visual impairment, including determining relevant personnel, resources, services, publications, and organizations.

3. Identify the roles and responsibilities of teachers of students with visual impairments.

4. Apply educational definitions, criteria for eligibility, and placement options, including strategies for determining service delivery models and the amount of contact time, for students with visual impairments.

5. Apply ethical principles and professional practices related to the education of students with disabilities (e.g., relating to behavior management, mandated reporting, confidentiality, students' family rights, responsibilities of stakeholders, inclusion, equity, and due process).

2 Knowledge of the visual system and the impact of visual impairments on development

1. Identify the structures, functions, and processes of the visual system, including brain-based anatomy involved in visual processing.

2. Apply concepts related to the typical developmental stages for acquisition of visual skills.

3. Distinguish between the causes and characteristics of diseases and disorders of the visual system, including brain-based conditions.

4. Determine the impact of a visual impairment on the overall development and functional use of vision for individuals with co-occurring exceptionalities (e.g., deafblindness, learning disabilities, autism spectrum disorder).

5. Distinguish characteristics that may indicate the presence of a visual impairment.

6. Analyze the unique implications of visual impairment on the developmental domains (e.g., motor, cognitive, communication, affective, sensory) from birth through age 22.

3 Knowledge of compensatory skills for students with visual impairments

1. Interpret the braille code and rules for UEB.
2. Interpret the braille code and rules of the Nemeth code.
3. Apply concepts regarding the use of the abacus.
4. Apply instructional strategies for teaching concept development.

4 Knowledge of assessment, screening, and evaluation procedures for determining eligibility, program planning, and progress monitoring of students with a medical diagnosis of visual impairment

1. Interpret eye medical reports and other vision-related diagnostic information, including terminology commonly used in evaluations of the eye and visual system.
2. Apply appropriate methods and materials used to evaluate functional vision.
3. Apply methods and materials used to conduct learning media assessments.
4. Apply methods and materials used to monitor progress and assess strengths and needs in each area of the ECC.
5. Apply methods and materials used to conduct O&M screenings.
6. Interpret vision-specific assessment results to make recommendations to individuals involved in students' education for assessment or instructional purposes, and for students with visual impairments to participate in assessments (e.g., classroom, district, state).
7. Apply methods for communicating the results of vision-related assessments to all members of the multidisciplinary team, including the student and the parents or guardians.

5 Knowledge of the ECC

1. Identify skills within all areas of the ECC.

2. Evaluate the impact of visual impairment on social skills unique to students with visual impairments, including instructional strategies for developing social-interpersonal skills.

3. Evaluate the impact of visual impairment on the development of skills related to independent living (e.g., working with finances, cooking, personal hygiene, dressing) unique to students with visual impairments.

4. Evaluate the impact of visual impairment on the acquisition of career education skills, including instructional strategies unique to students with visual impairments.

5. Evaluate the impact of visual impairment on play, leisure, and recreational activities, including instructional strategies unique to students with visual impairments.

6. Evaluate the impact of visual impairment on the development of self-determination skills (e.g., self-advocacy, self-awareness, time management, self-reliance, self-esteem), including instructional strategies unique to students with visual impairments.

6 Knowledge of specialized learning related to literacy media, assistive technology, and access for students with visual impairments

1. Identify procedures for teaching and supporting students' visual efficiency skills and using optical and non-optical low vision aids to meet their individual needs.

2. Apply various environmental adaptations (e.g., variations in lighting, color, contrast, positioning, size, and sound) and how they may be used to enhance access.

3. Apply practices for managing and implementing assistive technology (e.g., low-tech, high-tech) for supporting students' access to instruction, communication, and independence and meeting their individual and unique needs.

4. Apply sensory efficiency skills, including instructional strategies for developing the use of other senses, for students with visual impairments.

5. Identify barriers that may impact students' interactions with information and determine tools and strategies to address these barriers.

6. Apply instructional strategies specific to the role of the teacher of students with visual impairments to reinforce basic O&M skills (e.g., mobility tools, human guide, protective techniques, self-familiarization).

7 Knowledge of instructional strategies and methods for teaching students with visual impairments

1. Apply strategies to address the impact of visual impairment on incidental learning.

2. Apply components of systematic instruction (e.g., task analysis, chaining, response prompting, specific praise) to teach a range of skills and concepts.

3. Identify strategies and techniques for implementing students' use of accommodations to support access to instruction and independence within environments (e.g., school, home, community).

4. Apply instructional strategies for teaching tactile learning (e.g., tactile perception, object exploration, graphic interpretation).

5. Apply components of explicit instruction, such as pre-teaching and modeling, to teach a range of skills and concepts.

6. Apply strategies and methods for teaching students a variety of communication methods (e.g., listening and compensatory auditory skills, use of assistive technology devices, braille reading and writing, tangible and picture symbols, tactile graphics).

7. Apply instructional methods and identify resources and assistive technology (e.g., low-tech, high-tech) to support students' abilities to interact with information across both physical and digital environments.