



The *PRAXIS*<sup>®</sup> Study Companion

# Early Childhood Assessment (5026)



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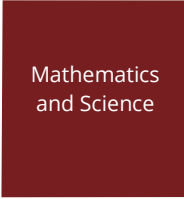
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## Early Childhood Assessment (5026)

### Test at a Glance

The Early Childhood Assessment is designed for candidates who possess the knowledge, skills, and abilities in early childhood reading and language arts, social studies, math, and science instruction that are important and necessary as they prepare to enter the field of elementary education in prekindergarten and the lower elementary grades.

<b>Test Name</b>	Early Childhood Assessment
<b>Test Code</b>	5026
<b>Time</b>	4 hours
<b>Number of Questions</b>	180 selected-response questions
<b>Format</b>	The test consists of a variety of selected-response questions, where you select one or more answer choices, and other types of questions. You can review the possible question types in Understanding Question Types.
<b>Test Delivery</b>	Computer delivered

Early Childhood Assessment	Subtests	Subject Test Length (Minutes)	Approximate Number of Questions
 	5027 Reading and Language Arts & Social Studies	120	90
	5028 Mathematics and Science	120	90

### About the Test

The Early Childhood Assessment test consists of two subtests—Early Childhood: Reading and Language Arts & Social Studies and Early Childhood: Mathematics and Science.

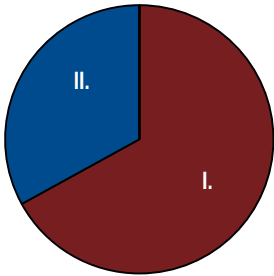
The Early Childhood: Reading and Language Arts & Social Studies subtest consists of 90 test questions that are based on *The Standards for the English Language Arts*, published by the National Council of Teachers of English (NCTE) and the International Literacy Association (ILA), and social studies content standards developed by the National Council for the Social Studies (NCSS).

The Early Childhood: Mathematics and Science subtest consists of 90 test questions and is based on the National Council of Teachers of Mathematics (NCTM) standards, the National Science Teaching Association (NSTA) standards, and the Next Generation Science Standards (NGSS).

This test may contain some questions that will not count toward your score.

## Early Childhood: Reading and Language Arts & Social Studies (5027)

<b>Test Code</b>	5027
<b>Time</b>	2 hours
<b>Number of Questions</b>	90 selected-response questions
<b>Format</b>	Selected-response questions
<b>Test Delivery</b>	Computer delivered

	<b>Reading and Language Arts &amp; Social Studies Categories</b>	<b>Approximate Number of Questions</b>	<b>Approximate Percentage of Examination</b>
	I. Reading and Language Arts	60	67%
	II. Social Studies	30	33%

### About the Subtest

The *Praxis* Early Childhood: Reading and Language Arts & Social Studies subtest is designed for prospective teachers of children in prekindergarten and the lower elementary grades. The 90 selected-response questions cover the major concepts in the content areas of reading and language arts and social studies necessary to be licensed as a beginning teacher at the elementary school level. The assessment is designed and developed through work with practicing early childhood and elementary teachers, teacher educators, higher education content specialists familiar with *The Standards for the English Language Arts*, published by the National Council of Teachers of English (NCTE) and the International Literacy Association (ILA), and social studies content standards developed by the National Council for the Social Studies (NCSS).

The test consists of a variety of selected-response questions for which you will select one or more answer choices, and other types of questions. You can review the possible question types in Understanding Question Types.

This test may contain some questions that will not count toward your score.

## Content Topics

This list details the topics that may be included on the test. All test questions will cover one or more of these topics.

### I. Reading and Language Arts

#### A. Emergent Literacy: Foundational Skills

1. Recognizes various stages of language acquisition (e.g., oral language, written language -- including spelling)
2. Differentiates approaches in the planning and implementation of instruction for all students with diverse needs, including English learners (ELs), students with special needs, and gifted and talented students
3. Knows how to help students develop an understanding of print awareness (e.g., environmental print, print concepts)
4. Understands the role of phonological awareness and phonemic awareness in literacy development
  - a. explains the importance of phonological awareness as a foundational skill for literacy development
  - b. identifies and provides examples of phonemes, syllables, onsets, and rimes

- c. identifies and provides examples of blending, segmenting, substituting, and deleting phonemes

#### B. Reading: Foundational Skills

1. Understands the role and importance of phonics and word analysis in literacy development
  - a. knows common letter-sound correspondences and syllabication patterns (e.g., CVC, VC, CV)
  - b. knows spelling conventions (e.g., irregularly spelled words, homonyms, homophones)
  - c. distinguishes high-frequency sight words from decodable words appropriate for particular grades
  - d. identifies roots and affixes to decode unfamiliar words
2. Understands the role of fluency in literacy development
  - a. defines fluency and related terms (e.g., accuracy, rate, prosody)
  - b. knows strategies to develop students' fluency to support comprehension (e.g., selecting appropriate texts, modeling fluent reading, choral reading, repeated reading) and explains the impact of fluency on comprehension

**C. Reading: Literature and Informational Text**

1. Understands how to use key ideas and details to comprehend literature, informational text, and images
  - a. identifies the key details, moral, and/or theme of a literary text, citing specific textual evidence
  - b. identifies the key details and/or central idea of an informational text, citing specific textual evidence
  - c. makes inferences from a text and supports them with appropriate evidence
  - d. summarizes information from a text
  - e. analyzes the characters, setting, sequencing, and plot of a literary text
  - f. analyzes the relationships among individuals, events, ideas, and concepts in an informational text
2. Understands how features and structures of text across genres affect comprehension
  - a. identifies structural elements of literature across genres (e.g., casts of characters and stage directions in drama, rhyme and meter in poetry)
  - b. uses text features (e.g., sidebars, hyperlinks, images) to locate information in a print or digital informational text
  - c. identifies organizational structures of informational (e.g., cause/effect, problem/solution, comparison) and literary text (e.g., exposition, rising action, climax, resolution)
  - d. identifies how structural elements (e.g., header, graphs, images) contribute to the development of informational and literary text
3. Understands the concept of point of view using evidence from the text
  - a. identifies author's point of view in various genres and supports conclusions with evidence from the text
  - b. compares multiple points of view about the same event or topic
  - c. identifies how point of view affects the overall structure of a literary or informational text
4. Understands how to integrate and compare written, visual, and oral information from texts and multimedia sources
  - a. explains how visual and oral elements enhance the meaning and effect of a literary text (e.g., picture book, graphic novel, multimedia presentation)
  - b. compares the written version of a literary text with an oral, staged, or digital version



- c. compares two or more texts (literary and/ or informational) that address the same theme or topic
  - d. interprets visual and multimedia elements in literary and informational texts
5. Knows the role of text complexity in reading development
- a. explains the factors that contribute to text complexity (e.g., vocabulary, sentence complexity, images)
  - b. identifies and uses multiple text-leveling systems
  - c. selects appropriate texts for readers at various levels

**D. Writing**

1. Knows the developmental stages of writing
  - a. identifies a developmentally appropriate continuum of writing (e.g., drawing, scribbling, combining strings of letters)
  - b. recognizes strategies to support the development of emergent writing (e.g., copying print, understanding how print conveys a message)
  - c. identifies the developmentally appropriate continuum of spelling
2. Understands the characteristics of common types of writing
  - a. distinguishes among common types of writing (e.g., persuasive, informative/explanatory, narrative)
  - b. identifies the purpose, key components, and subgenres (e.g., advertisements, recipes, narrative poems) of each common type of writing
  - c. evaluates the effectiveness of writing samples of each type
3. Understands the authoring cycle of writing
  - a. identifies steps of the authoring cycle (e.g. brainstorming, outlining, publishing)
  - b. identifies the interrelationships among planning, revising, and editing in the process of writing
4. Understands the characteristics of effective writing
  - a. evaluates the appropriateness of a particular piece of writing for a specific task, purpose, or audience
  - b. evaluates the development, organization, or style of a piece of writing
  - c. identifies appropriate revisions to strengthen a sample of writing

- d. recognizes writing that is clear and coherent and understands its elements (e.g. support, conclusion, sequence)
- 5. Knows the purpose of digital media literacy for production and distribution of writing
  - a. identifies the characteristics and purposes of a variety of digital tools for producing and publishing writing
  - b. selects the appropriate digital tools for a specific purpose and audience
- 6. Knows the research process that builds knowledge about a topic
  - a. identifies the steps in the research process
  - b. distinguishes between primary and secondary sources and their uses
  - c. distinguishes between paraphrasing and plagiarizing
  - d. knows how to locate credible print and digital sources, locate information within the sources, and cite the sources

### **E. Speaking and Listening**

- 1. Knows the characteristics of effective collaborative discussions

- a. identifies techniques to communicate for a variety of purposes
- b. identifies the characteristics of active listening
- c. knows strategies for promoting conversations (e.g., types of questions, modeling metacognition, providing opportunities)
- 2. Knows the characteristics of engaging oral presentations
  - a. identifies elements of engaging oral presentations (e.g., volume, articulation, awareness of audience, eye contact)
  - b. differentiates between formal and informal language use (e.g., code switching)
  - c. identifies the characteristics of being a respectful audience member

### **F. Language**

- 1. Knows the conventions of Standard English grammar, usage, mechanics, and spelling.
  - a. explains the function of different parts of speech and spelling
  - b. corrects errors in usage, mechanics
  - c. identifies examples of different sentence types (e.g., simple, compound, compound- complex)



- d. identifies how varieties of English (e.g., dialects, registers) used in stories, dramas, or poems support the overall meaning
2. Understands how to determine the meaning of words and phrases
  - a. determines the literal meaning of unknown words and phrases from context, syntax, and/or knowledge of roots and affixes
  - b. identifies types of figurative language
  - c. interprets figurative language
  - d. analyzes the relationship between word choice and tone in a text
  - e. uses images and texts to determine the meaning of unknown words and phrases
3. Understands characteristics of conversational, academic, and domain-specific language
  - a. differentiates among types of vocabulary (e.g., common words, multiple meaning words, content-specific words)
  - b. identifies relevant features of language such as word choice, word order, and punctuation

### Reading and Language Arts Discussion Questions

- What are the stages of oral language acquisition that a teacher would see in an early childhood classroom?
- What are three strategies that are effective for developing and accessing print awareness?
- Identify each of the following literacy teaching strategies and how each strategy could be used to help a student for whom English is a second language: grapheme-phoneme correspondence; journal writing; shared writing; cueing systems; rubrics; and reflective logs.
- Compare the basic components of teaching phonological awareness, such as blending, segmenting, substitution, and deletion.
- What order should the letter-sound relationships be taught in?
- What word families and word patterns should students examine?
- Before introducing phonics, a teacher should ensure students have mastered what kinds of skills?
- How do phonemic awareness, sentence decoding, word families, root words, and phonics support literacy development? Identify each of these specific literacy concepts and the role each plays in literacy development.
- How does fluency impact comprehension?
- How can strategies like repeated reading and choral reading improve students' fluency?
- What are the common features of informational texts, and how can they best guide students?

- Choose an age level and develop a literacy lesson that would introduce story structure.
- How do you explain to students that presenting an issue from various points of view adds multiple layers of meaning to a text?
- When evaluating a text's complexity, what three pieces of information should a teacher consider?
- How do young children move through the developmental stages of writing, and what are the characteristics of each stage?
- Know the purposes of the three types of writing that students should be familiar with and give examples of each.
- How do you explain the steps in the authoring cycle of writing?
- How can students ensure that online resources are credible and unbiased?
- What is the difference between a primary and a secondary source?
- How can a teacher both ensure and assess active listening in students?
- What elements, both verbal and nonverbal, make for an effective oral presentation?
- List and define the various parts of speech.
- How can students use roots and affixes, syntax, and context clues to help determine word meaning?
- How do you select content-specific or multiple-meaning words that support a content-based unit of study?

## II. Social Studies

### A. Community, Culture, and Identity

1. Knows the components of community and how they interact
  - a. Understands the process of exploring, identifying, and analyzing identity, individual development, and relationships to others (e.g., self-concept, self-awareness, and self-regulation and how they develop)
  - b. Understands how institutions (e.g., religious, academic, government) influence individual identity, relationships, beliefs, and behaviors
2. Knows the components of culture and why the study of culture is important
  - a. Understands ways in which families, groups, societies, and cultures address similar human wants, needs, and concerns
  - b. Understands ways in which cultural perspectives shape experiences and perceptions
  - c. Understands the influence of language, literature, music, and artistic creations as expressions of culture and people

- d. Understands ways in which people from different cultures perceive and interact with the physical environment and social conditions
- e. Understands the concepts of unity and diversity within and across groups
- f. Understands the concepts of interdependence and intradependence between and among cultural groups

**B. People, Places, and Environments**

- 1. Understands spatial thinking, geographic perspectives, and the relationship between human beings and their environment
  - a. Understands geographic concepts (e.g., region, measurement, directional terms, landmarks, distance, location)
  - b. Understands geographic literacy skills (e.g., the construction and use of maps, graphs, charts, and technology)
  - c. Understands the physical and human-made characteristics of different places and how they affect human behavior and experience (e.g., rain forest, desert, urban and rural communities)

- d. Understands the interdependence of living things, the environment, and the economy

**C. Time, Continuity, and Change**

- 1. Knows ways in which human beings seek to understand their historical roots and to locate themselves in time
  - a. Understands chronological thinking skills
  - b. Understands how to analyze historical data (e.g., time lines, maps, graphs, and tables)

**D. Civics and Government**

- 1. Understands the importance of civic participation and how people create and change structures of power, authority, and governance
  - a. Understands key civics concepts (e.g., human dignity, justice, equality, equity, tolerance, rule of law, citizenship, voting)

- b. Understands civic participation in the context of classroom, community, nation, and world (e.g., raising an issue, making an informed decision, considering other perspectives, balancing individual and group needs, students' right to vote and participate in decision making)

### **Social Studies Discussion Questions**

- How might a teacher help early childhood students understand social studies processes and skills?
- What attitudes, values, and ideas do children bring to the classroom? How do children learn about others?
- How might a teacher promote self-awareness and self-regulation in the classroom?
- How do institutions influence the relationships and behaviors among historical actors and students in the classroom?
- How do cultural perspectives shape student experiences?
- How can a teacher include the arts in social studies instruction?
- How do people from different cultures perceive and interact with their environments and social conditions?
- Describe how different cultural groups can be interdependent.
- What concepts cut across the social studies disciplines? What connections can be made among the disciplines?
- How can students demonstrate knowledge about absolute location?
- How would you use relative location to explain how to travel to your local library?
- What characteristics can be used to define a region?
- What types of data are most useful in creating a political map? What types of data are most useful in a physical map?
- How have humans influenced their physical environments?
- Describe the physical characteristics of different places, such as rain forests, deserts, and urban and rural communities.
- How have economies been influenced by physical environments?
- What were the major impacts of historical movements such as the abolition movement, the suffrage movement, and the Civil Rights movement?
- Compare and contrast various pre-Columbian Native American societies.
- What motivated European colonization in North America?
- How did European colonizers and Native American groups interact?
- How did the institution of slavery contribute to political, social, and economic tensions in the United States?
- How have efforts to address inequalities and injustices influenced the history of the United States?
- Place the following events in chronological order: the American

Revolution, the Second World War, the Civil War, and the Spanish-American War.

- Who were the major historical figures of historical events such as the American Revolution, the Early Republic, and the Civil War?
- How have cultural groups influenced United States society?
- How can historical data from graphs, maps, and time lines facilitate instruction about historical concepts?
- How can a teacher best utilize primary and secondary sources in the classroom?
- How can the social studies support informed citizenship?
- How can young students participate in civic life?
- How does civic participation influence democracy?
- How can teachers facilitate informed decision making?
- How is the United States federal government structured?
- What powers do states share with the federal government? What powers are reserved to the states?
- What are the main differences between the various forms of governments (e.g. monarchy, democracy, theocracy) ?
- Describe the authority of various public officers in the United States, such as the president, senators, governors, and mayors.

## Early Childhood Assessment: Mathematics and Science (5028)

	Mathematics and Science Categories	Approximate Number of Questions	Approximate Percentage of Examination
	III. Mathematics	58	64%
	IV. Science	32	36%

### About This Subtest

The *Praxis* Early Childhood: Mathematics and Science subtest is designed to assess the content knowledge that prospective early childhood teachers must have to support children’s learning in these content areas. The 90 selected-response questions focus on the broad knowledge of mathematics and science necessary for prospective teachers of children in prekindergarten and the lower elementary grades. The specifications for this subtest were confirmed by an advisory panel consisting of expert elementary teacher educators and specialists familiar with the National Council of Teachers of Mathematics (NCTM) standards, the National Science Teaching Association (NSTA) standards, and the Next Generation Science Standards (NGSS).

The test consists of a variety of selected-response questions for which you will select one or more answer choices, and other types of questions. You can review the possible question types in Understanding Question Types.

This test may contain some questions that will not count toward your score.

## Content Topics

This list details the topics that may be included on the test. All test questions will cover one or more of these topics.

### I. Mathematics

#### A. Numbers and Operations— Whole Numbers

1. Understands the processes, skills, and concepts related to the place-value system
  - a. Compares and orders whole numbers
  - b. Composes and decomposes multidigit numbers by using place value
  - c. Given a digit, identifies the place the digit is in and its value in that place
  - d. Recognizes that a digit in one place represents ten times what it represents in the place to its right and one-tenth what it represents in the place to its left, and extends this reasoning to any number of places
  - e. Rounds multidigit numbers to any place value
  - f. Converts between numeral form, expanded form, and word form for numbers
2. Knows how to apply appropriate mental strategies for performing operations
  - a. Recognizes patterns, math facts, composition and decomposition of numbers, and compensation as mental strategies
  - b. Selects and utilizes appropriate strategies
3. Understands processes, skills, and concepts related to operations involving whole numbers
  - a. Uses concrete models, drawings, and number lines to illustrate, interpret, and explain addition, subtraction, multiplication, and division of whole numbers, including multidigit numbers
  - b. Illustrates and explains multiplication and division problems using equations, rectangular arrays, area models, and partitioning
  - c. Uses various strategies and algorithms to perform operations on whole numbers, including multidigit numbers, and interprets the remainder in division problems in context
  - d. Uses the four operations (addition, subtraction, multiplication, and division) to solve multistep mathematical and real-life problems involving whole numbers and determines whether answers are reasonable



- e. Identifies different problem situations (e.g., adding to, taking away from, comparing)
- f. Uses the relationship between operations to solve problems (e.g., inverse operations, repeated addition, repeated subtraction)

## **B. Numbers and Operations—Fractions**

1. Understands the multiple representations and meanings of a fraction
  - a. Converts between fractions and decimals
  - b. Recognizes that a fraction can be interpreted as division of the numerator by the denominator or the remainder in a whole number division problem
2. Understands the processes, skills, and concepts for working with rational fractions
  - a. Represents fractions using visual fraction models, sets of objects, grids, area models, and number lines
  - b. Composes and decomposes fractions and understands the use of unit fractions
  - c. Recognizes that the value of a unit fraction decreases as the value of the denominator increases
  - d. Writes equivalent fractions

or uses equivalent fractions (including whole numbers) and benchmark fractions to compare fractions

- e. Explains why the same whole must be used when comparing fractions

## **C. Algebraic Thinking**

1. Knows the processes, skills, and concepts related to patterns
  - a. Identifies, extends, describes, or generates number, shape, and other repeating patterns
  - b. Makes conjectures, predictions, or generalizations based on patterns
2. Knows the properties of the four operations and the processes, skills, and concepts for solving abstract or real-world problems
  - a. Applies properties of operations (i.e., commutative, associative, distributive) and uses them as strategies to add, subtract, multiply, and divide
  - b. Uses the order of operations to solve multistep problems
  - c. Represents and solves word problems involving the four operations using equations with a variable representing the unknown in any position

**D. Geometry, Measurement, and Data**

1. Understands the processes, skills, and concepts for reasoning about shapes and their attributes
  - a. Classifies and compares shapes according to their attributes
  - b. Identifies two- and three-dimensional shapes by name
2. Understands the processes, skills, and concepts for solving problems involving measurement and estimation using standard and nonstandard units of measure
  - a. Solves problems involving elapsed time, money, length, volume, and mass
  - b. Solves mathematical and real-life problems involving perimeter and area of polygons, including shapes that are partitioned into parts with equal areas, where the area of each part is a fraction of the entire area of the shape
  - c. Relates the concept of area to the operations of multiplication and addition
  - d. Uses relative sizes of United States customary units and metric units and converts units within each system
3. Understands the processes, skills, and concepts for

representing and interpreting data

- a. Collects, organizes, and represents data
- b. Interprets data presented in various graphical formats

**Mathematics Discussion Questions**

- What is required for a child to have an understanding of numbers and operations? What is an appropriate progression of introducing new skills and concepts at the early childhood level? Consider your response in relation to number names, counting, comparing and ordering numbers, place value, composing and decomposing base-10 numbers, addition and subtraction, and multiplication and division.
- What are the advantages of using base-10 numerals rather than another notation for numbers (for example, Roman numerals or tally marks)? Why is it important that students know how to convert between standard base-10 numerals and expanded form?
- What are some ways that early childhood students can model whole numbers and operations on whole numbers? How can the commutative, associative, and distributive properties of operations be used when solving problems involving whole numbers?
- How is division related to multiplication? How does partitive division differ from quotative division? What types of real-world problems involving whole number division require students to interpret a nonzero remainder?
- How is a fraction related to a remainder in whole number division? Why are unit

fractions important? How are equivalent fractions useful? What are some ways that students can model fractions?

- How are fractions related to decimals? What is the relationship between a fraction and a ratio?
- How can activities involving patterns and relationships create a foundation for understanding algebraic reasoning?
- What is the order of operations and why is it used?
- What activities can help students identify objects in the environment that have specific two- and three-dimensional shapes? How can a teacher help students analyze, classify, and compare two- and three-dimensional shapes in different sizes and orientations?
- What measurement units, systems, processes, techniques, tools, and formulas are appropriate for early childhood students? Why is it useful to have students measure objects using nonstandard units?
- How is measurement information best conveyed for student understanding? Consider all areas of measurement, including length, area, volume, mass, money, and time.
- What kinds of data are appropriate for early childhood students to collect, organize, and display? What kinds of information might students find in their data?

## I. Science

### A. Nature of Science and Engineering

1. Engaging with the natural world

- a. Basic science skills (e.g., observing; describing; using appropriate tools; collecting and analyzing data; drawing conclusions; communicating findings)
  - b. Crosscutting concepts (e.g., cycles; patterns; cause and effect; systems)
2. Solving problems related to the everyday world
    - a. Defining a simple problem
    - b. Developing a possible solution by using sketches, drawings, and physical models
    - c. Comparing different solutions to determine which solution best solves the problem

### B. Physical Science

1. Basic properties of matter (color, texture, hardness)
2. Basic properties of waves (sound and light)
3. Energy and changes resulting from heating, cooling, mixing; placing in sunlight
4. Forces and motion and interaction of objects (effect of pushes and pulls on the motion of an object)

### C. Earth and Space Science

1. Motion of the Earth, Sun, Moon and stars and the effect on seasonal and daily weather and daylight patterns
2. Basic physical and chemical properties of Earth materials

(sand, soil, rocks, water) and the changing Earth system (fast or slow change; fossil evidence; human impact; land, water and air)

#### D. Life Science

1. Basic characteristics of organisms and their environments (e.g., survival needs and behaviors; structures that support growth; habitats)
2. Life cycles of organisms and inherited traits
3. Interdependent relationships in ecosystems

#### Science Discussion Questions

- How might a teacher help early childhood students understand science process and skills?
- What is the inquiry method as it related to science?
- What is a scientific hypothesis?
- What concepts cut across the scientific disciplines?
- What are some other examples of measuring instruments?
- What graphical method would be most suitable for illustrating the relative amounts of solid waste that are recycled, incinerated, and disposed of in landfills?
- Give examples of how an event, such as the clear-cutting of the tropical rain forests, has had both positive and negative impacts on humans and the environment.
- Compare the pros and cons of the following sources of power: geothermal, nuclear, hydroelectric, solar, and fossil fuel.
- What are some of the signs that a chemical reaction took place when two substances are mixed?
- What is an example of a change of state?
- Is concrete one substance or a mixture?
- What is an example of a device that converts chemical energy into light?
- Does air take up space?
- What causes an object in motion to accelerate or slow down?
- What is the difference between weight and mass?
- Describe various ways in which an object can have several forces acting on it and still be at rest.
- How are visible light waves similar and different from sound waves and water waves?
- What is an example of light bending?
- What are some examples of attractive forces?
- How does a compass work?
- How is the energy of a rock sitting on the top of a hill different from the energy of a rock sitting at the bottom of the same hill?
- What is the inside of Earth like?
- What is the difference between rocks and minerals?
- What are fossils and how are they formed?

- What causes a volcano to erupt?
- What causes earthquakes?
- What causes tides? What do “low tide” and “high tide” mean?
- How do oceans affect climate?
- What causes the seasons on Earth?
- How does a lunar eclipse occur?
- How are the inner planets of the solar system different from the outer planets?
- How are stars different from planets?
- Why do the coldest temperatures in the Northern Hemisphere occur during the month of January even though Earth is closer to the Sun in January than it is in July?
- What do microscopes show us about cells?
- Why are roots, stems, and leaves important to plants?
- What are the major components of the human circulatory system?
- How does the human digestive system work?
- What are dominant and recessive traits?
- How can two parents with brown eyes have a child with blue eyes?
- How does the human body maintain a constant temperature?
- What happens if certain kinds of organisms, such as edible plants, are introduced or removed from a food chain?
- What are the roles of producers and decomposers in a food web?

## Reading and Language Arts & Social Studies (5027): Sample Test Questions

*The sample questions that follow are examples of the kinds of questions that are on the test. They are not, however, representative of the entire scope of the test in either content or difficulty. Answers with rationales follow the questions.*

**Directions:** Select the best answer or answers for each question below.

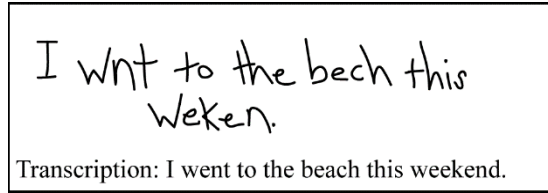
### Reading and Language Arts Sample Test Questions

1. Which of the following is the most effective strategy for supporting an English learner who is working with phonics?
  - (A) Avoiding picture clues until the student learns basic sight words
  - (B) Encouraging the student to limit the use of a primary language in the classroom
  - (C) Implementing direct teaching of letter-sound relationships for the student
  - (D) Waiting to teach phonemes until the student has obtained oral language proficiency in English
  
2. My grandmother enjoys making delicious meatballs for the entire family, but my sister refuses to eat them.

The sentence can best be described as

- (A) compound
- (B) complex
- (C) simple
- (D) compound-complex

3.



The student writing shown is best described as

- (A) early emergent
  - (B) emergent
  - (C) transitional
  - (D) conventional
4. A student reading a Web article about sea turtle habitats wants to learn more about kelp forests. Which of the following text features would provide the most information about this topic?
- (A) A caption below a photo of a sea turtle swimming
  - (B) A sidebar about how turtles build shelters underwater
  - (C) A pop-up with a glossary definition of a kelp forest
  - (D) A hyperlink to an article about underwater vegetation
5. In which **TWO** of the following words do the underlined portions exemplify a closed syllable pattern?
- (A) hap-py
  - (B) e-late
  - (C) joy-ful
  - (D) con-tent
  - (E) de-light



6. Which of the following is a primary feature of the grade-level equivalent text-leveling system?
- (A) Uses a range of .1 to .9 to identify text difficulty per grade level
  - (B) Uses a detailed, alphabetic system to label reading levels with each grade level
  - (C) Identifies the independent reading level for students in grades K through 8
  - (D) Assigns the difficulty level of prose text from below 200L to above 1600L

7. Which of the following is the rime in the word “splash”?
- (A) “sp”
  - (B) “spl”
  - (C) “ash”
  - (D) “lash”

8. Read the following example of student writing.

The children were excited to go back to school in September. The teachers were excited to go back to school, too.

Which of the following revisions best improves the writing?

- (A) The children and the teachers were excited to go back to school in September.
  - (B) The teachers were excited to go back to school in September; and the children were excited too.
  - (C) The children and the teachers were excited too, about going back to school in September.
  - (D) In September, the children were excited to go back to school and so were the teachers.
9. In a student discussion about whether the school cafeteria should stop selling junk food, which of the following statements best demonstrates active listening?
- (A) “In my opinion, it would be a mistake to remove junk food from the cafeteria because no one would eat there anymore.”
  - (B) “Raul thinks that our health should come before eating what we love, but Lacey argues that the schools should not take away our right to choose.”
  - (C) “How many of you would actually buy lunch if the cafeteria stopped selling junk food?”
  - (D) “What if we write a formal complaint to the superintendent to voice our opinion on the food in the cafeteria?”

10. Which **TWO** of the following words are decodable?
- (A) Club
  - (B) And
  - (C) Think
  - (D) The
  - (E) Where
11. A student changes “rub” to “run” by changing the last phoneme. Which of the following best identifies the phonemic awareness skill the student is using?
- (A) Blending
  - (B) Segmenting
  - (C) Deleting
  - (D) Substituting
12. Which of the following is most typically included in the conclusion of an oral presentation?
- (A) An expansion of the thesis
  - (B) A summarization of the main points
  - (C) An attempt to build rapport with the audience
  - (D) A move to gain the audience’s attention
13. Which of the following sentences contains a simile?
- (A) As darkness fell, the rain poured down with a vengeance.
  - (B) After completing the difficult task, I felt as light as a feather.
  - (C) I was so hungry that I could have eaten everything in the store.
  - (D) I watched in wonder as the white-capped waves washed the shore.

14. The grating grains in question were formed by millions of years of meteorite impacts that repeatedly crushed and melted rocks, creating tiny shards of glass and mineral fragments. Because the Moon has no atmosphere to speak of, there's no wind or weather to cause erosion, so the grains never lose their rough edges. When lunar dust gets inside moving parts, like those in a rover's wheel, it's so abrasive that it can damage the mechanisms. And the more joints you have in a system, the more places you have for dust to creep in.

—Abby Tabor, from "When the Moon Dust Settles, It Won't Settle in VIPER's Wheels,"  
NASA's Ames Research Center

Which of the following inferences about lunar dust can best be made based on information in the passage?

- (A) The abrasive nature of lunar dust damages equipment.
  - (B) Mineral fragments are just one component of lunar dust.
  - (C) The grains of lunar dust never lose their rough edges.
  - (D) The wheels of a rover have many joints that can be damaged by lunar dust.
15. A student reading a text out loud frequently forgets to pause and take a breath after ending punctuation in sentences. Which of the following best identifies the component of reading that the student needs further support with?
- (A) Comprehension
  - (B) Rate
  - (C) Prosody
  - (D) Accuracy

## Social Studies Sample Test Questions

16. A teacher overhears student conversations during class and learns that many of them love to play with toy bricks and logs that can be used to make objects such as buildings and spaceships. During a unit on the American Revolution, the teacher assigns students to use the toys to each create a diorama of an important event before the outbreak of the American Revolution. Which of the following is the most likely instructional benefit provided by the assignment?
- (A) Appealing to student creativity and engagement
  - (B) Preventing students from losing focus during class
  - (C) Facilitating the use of differentiated instruction
  - (D) Considering multiple points of view

17. During a history lesson, a teacher ties a string from one side of the classroom to the other. Hanging from the string at random intervals are signs labeled with events that led to the start of the American Revolution. The signs do not display the dates of the events. Students take turns moving signs on the string to appear in order from earliest to latest until the signs are all in the correct order.

Which of the following lesson objectives best matches the activity?

- (A) Students will demonstrate the ability to consider alternate points of view.
- (B) Students will compare and contrast the characteristics of famous individuals.
- (C) Students will identify cause-and-effect relationships to determine chronology.
- (D) Students will analyze historical data to determine the importance of historical events.

18. A third-grade teacher has completed a lesson on the United States Constitution and wants to assess whether students understand the importance of the Bill of Rights. During a classroom activity, students work in groups to draft and ratify a classroom bill of rights. Listed below are examples of amendments suggested by some of the students.

- Students must come to school on time.
- Students cannot go outside for recess until they clean up their desks.
- Students have the right to ask questions if they need help with their work.
- Students need to respect the teacher and the principal.
- Students may bring a book to share in the class library.

Based on the examples suggested by the students, it is evident that further instruction is required on which of the following concepts?

- (A) The importance of laws and rules
- (B) The authority structure of the school faculty
- (C) The purpose of punishments for committing crimes
- (D) The difference between freedoms and responsibilities

19. A third-grade teacher is planning a geography activity in which students determine the highest points of elevation in four regions of the country. Which of the following tools will students need to learn to interpret to complete the activity?

- (A) Longitude and latitude
- (B) Contour lines
- (C) Scale
- (D) Compass rose

20. While reviewing a short assignment about money, a first-grade teacher notices an answer that represents a trend among student responses:

"In the United States today, most businesses trade food and goods with each other. This helps people get the things that they want."

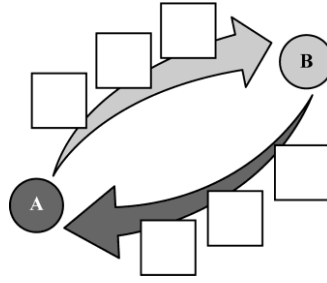
To address the misconception in the student responses, the teacher should focus instruction on which of the following concepts?

- (A) The difference between trade and bartering
- (B) The role of the government in the economy
- (C) The differences between needs and wants
- (D) The concept of supply and demand

21. In preparing a history unit on the American Revolution, a teacher decides to include sources from continental soldiers, enslaved people, Native Americans, and British loyalists. Which **TWO** of the following instructional goals does the inclusion of these groups best support?

- (A) Understanding how diverse groups can unite for a common cause
- (B) Understanding how cultural perspectives and experiences shape perceptions
- (C) Understanding the difference between primary and secondary sources
- (D) Understanding interdependence between and among cultural groups
- (E) Understanding ways in which people from different cultures interact with their environments

22.



The graphic organizer shown would be most useful to students during a lesson focused on which of the following learning objectives?

- (A) Understanding the chronology of events leading to the Civil War
  - (B) Determining the validity of secondary source documents
  - (C) Documenting the unemployment rate during the Great Depression
  - (D) Illustrating the Columbian Exchange between the New and Old Worlds
23. During an elementary school civics lesson, students ask how they can practice active citizenship without yet having the ability to vote. Which **TWO** authentic experiences can the teacher facilitate to meet the students' interests?
- (A) Attending a virtual city council meeting
  - (B) Collecting signatures for a petition to prevent construction in a local forest
  - (C) Obtaining boating licenses for students to use at a local lake
  - (D) Participating in a classroom mock trial based on a historical court case
  - (E) Preparing for a citizenship and naturalization interview
24. During a lesson on the creation of the Bill of Rights, an elementary social studies teacher notices that students are struggling to understand some of the language used in primary source documents. Which of the following actions should the teacher take to make the content more accessible to young students?
- (A) Excluding primary sources from future lessons to prevent further difficulty
  - (B) Focusing instruction on key concepts from the sources to limit cognitive strain
  - (C) Asking students to search for more age-appropriate translation on the Internet
  - (D) Developing a vocabulary quiz to assess mastery of language from the late 1700s

## Reading and Language Arts & Social Studies Answers

1. The correct answer is (C). Using an approach that follows a defined sequence, such as that of direct teaching of letter-sound relationships, helps students learn the relationship between letters and sounds and gives them the ability to begin blending sounds to form words.
2. The correct answer is (A). Compound sentences consist of two independent clauses joined together by a comma and a conjunction.
3. The correct answer is (C). The student is using a combination of invented spelling and traditional spelling, which are traits of transitional writing.
4. The correct answer is (D). A hyperlink will either direct students to another Web page/article with related information or to a pop-up with related, specific information to learn more about a key word or concept.
5. The correct answers are (A) and (D). Closed syllables possess short vowel sounds and end in a consonant. In (A), "hap" has the short "a" vowel and ends with the consonant "p." In (D), "tent" has the short "e" vowel and ends with the "t" consonant.
6. The correct answer is (A). The Grade Level Equivalent indicates the readability of the text by grade. Each grade level has a range of .1 to .9. For a text that is leveled at 1.2, the number to the left of the decimal represents the grade level and the number to the right of the decimal represents the month. So the text is appropriate for a student reading at the level of the second month of first grade.
7. The correct answer is (C). The rime is the part of the word including the vowel and the letters that follow.
8. The correct answer is (A). The revision successfully combines the two sentences by introducing a compound subject.
9. The correct answer is (B). The statement demonstrates paraphrasing of others' statements. An active listener spends more time listening than talking, which paraphrasing demonstrates.
10. The correct answers are (A) and (C). "Club" and "Think" can be sounded out or decoded.
11. The correct answer is (D). The student has substituted the "b" in "rub" for the "n" in "run" to create a new word.
12. The correct answer is (B). The conclusion of an oral presentation usually contains a clear summary of the main points to reinforce the presentation's goal.
13. The correct answer is (B). Similes compare two things using "like" or "as." The sentence makes a comparison between the speaker and a feather using the phrase "as light as a feather."
14. The correct answer is (D). The idea that the wheels of a rover have many joints that can be damaged by lunar dust is implied. It is not a fact explicitly stated in the passage.
15. The correct answer is (C). The student fails to account for punctuation while reading aloud, which is a component of prosody.



16. The correct answer is (A). Students have demonstrated that they are interested in creating models using building-block-style toys. The teacher chooses to appeal to that interest in an attempt to engage students in the content. (B) is incorrect because while the activity may encourage students to focus on their work, this is not the most valuable benefit. (C) is incorrect because the project can be completed by children of all ability levels with little to no differentiation. (D) is incorrect because the project is not likely to have students consider multiple points of view.
17. The correct answer is (C). Each sign is not labeled with the date of the event, so the activity requires students to consider the cause-and-effect relationships of events to assist them in determining their chronological order. (A) is incorrect because the students are not examining multiple points of view in the activity. (B) is incorrect because the students are not studying the characteristics of individuals. (D) is incorrect because the students are not using historical data to draw conclusions about the importance of historical events.
18. The correct answer is (D). The lesson activity is focused on the purpose and importance of the Bill of Rights, which guarantees people in the United States certain rights and freedoms. Some of the students' proposed amendments seem to be focused more on rules that must be followed than they are with rights that should be protected. The teacher should focus the next lesson on the differences between freedoms and responsibilities. (A) is incorrect

because the students seem to understand the importance of rules and laws, but they do not seem to understand the differences between those rules and laws and the freedoms and rights guaranteed by the Bill of Rights. (B) is incorrect because a lesson on the hierarchy or authority structure of the school faculty will not address the issues shown in student work. (C) is incorrect because the students seem to need help understanding the purpose of the Bill of Rights, which does not document punishments for crimes.

19. The correct answer is (B). Contour lines are used in topographic maps to represent elevation, or height above sea level.
20. The correct answer is (A). The student response indicates a misunderstanding of how businesses exchange goods and services for money and suggests that most businesses in the United States barter goods to one another. To address the misconception, the teacher can create a lesson that clarifies how most people purchase goods from businesses using money.
21. The correct answers are (B) and (D). The sources from continental soldiers, enslaved people, Native Americans, and British loyalists will show students widely diverse views about the American Revolution. These diverse views can help students understand how people with different cultural backgrounds and aspirations experience and perceive events and how their roles in historical events intersect and create interdependence.

22. The correct answer is (D). The Columbian Exchange is often illustrated by a two-way cycle listing the exchange of plants, animals, people, and pathogens between the Americas in the Western hemisphere and Europe, Asia, and Africa in the Eastern hemisphere.
23. The correct answers are (A) and (B). Attending a city council meeting, either virtually or in person, and collecting signatures for a petition are both ways that students under the age of 18 can practice active citizenship.
24. The correct answer is (B). Although young students may struggle with language used in the early 1700s, teachers can help to facilitate understanding by focusing instruction on the concepts and arguments made in the documents without requiring students to master the language or excluding the documents altogether.

## Mathematics and Science (5028) Sample Test Questions

*The sample questions that follow are examples of the kinds of questions that are on the test. They are not, however, representative of the entire scope of the test in either content or difficulty. Answers with rationales follow the questions.*

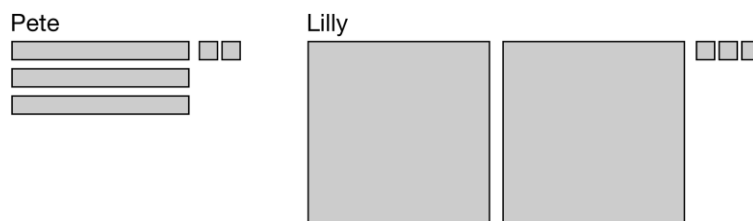
**Directions:** Select the best answer or answers for each question below.

### Mathematics Sample Test Questions

1. A second-grade teacher has each student randomly select a card that is marked with a three-digit number. Students then model their numbers with base-10 blocks on a place value mat. Which of the following whole-number concepts does the lesson best reinforce?
  - (A) Comparing quantities
  - (B) Describing quantities
  - (C) Ordering quantities
  - (D) Decomposing quantities
  
2. Which of the following word problems is most appropriate to use when first introducing the relationship between fractions and division?
  - (A) Five children are sharing one bottle of juice. If the juice is shared equally, how much of the bottle of juice will each child receive?
  - (B) Mario has  $1\frac{3}{4}$  hours to finish his 3 homework assignments. If he divides his time evenly, how much time can he spend on each?
  - (C) Samuel paid \$3.20 for  $\frac{1}{4}$  pound of fudge. What is the cost per pound of the fudge?
  - (D) Jacklyn has 2 bags of dog food. Each bag holds  $30\frac{1}{2}$  pounds of food. How many pounds of food does Jacklyn have altogether?

3. **Problem:** The gasoline tank in a car holds 15 gallons when full. If there are 7 gallons of gasoline in the tank, how many gallons of gasoline are needed to fill the tank?  
Which of the following is most appropriate to use to correctly answer the question shown?
- (A) Multiplication
  - (B) Subtraction
  - (C) Estimation
  - (D) Division
4. **Problem:** Twenty students from the first, second, third, and fourth grades are riding on a school bus. Eight of the students are in first grade and a total of one-fifth of the students are in second and third grade. What proportion of the students are in fourth grade?  
A teacher asks students to solve the mathematics problem shown. Which of the following responses best answers the question?
- (A) 0.2
  - (B) 0.4
  - (C) 0.6
  - (D) 0.8
5. The tallest tree in a park is 17 feet 4 inches tall, and the shortest tree in the park is 7 feet 8 inches tall. What is the difference in the heights of the trees?
- (A) 10 ft 6 in
  - (B) 10 ft 4 in
  - (C) 9 ft 8 in
  - (D) 9 ft 6 in
6. A first-grade teacher is planning activities to introduce students to nonstandard units of measurement. Which of the following activities will best meet the teacher's goal?
- (A) Asking students to stand in a line from the shortest person to the tallest
  - (B) Asking students to use pencils to measure the length of a desk
  - (C) Asking students to determine how many one-liter bottles of water can fill a one-gallon container
  - (D) Asking students to use a measuring tape to measure the length of the classroom door

7. A third-grade teacher provides groups of students with standard sets of fraction pieces. The teacher displays a fraction piece representing  $\frac{1}{2}$  and then asks the students to use other fraction pieces identical to each other but different from the one that represents  $\frac{1}{2}$  to model the  $\frac{1}{2}$  piece. Which of the following is most likely the primary purpose of the activity?
- (A) Ordering unit fractions  
 (B) Adding rational numbers  
 (C) Finding equivalent fractions  
 (D) Converting fractions to percents
8. The figure shows how Pete and Lilly each used base-10 blocks to represent a number. They then posed the following problem for their peers to solve. How should Lilly's model be adjusted to show 7 times Pete's number?



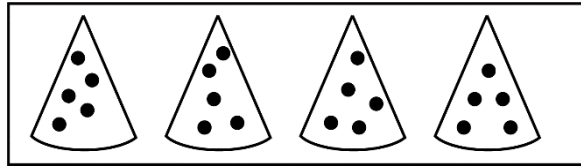
What is the answer to Pete and Lilly's problem?

- (A) Add two ten rods and one unit cube to Lilly's model.  
 (B) Add two ten rods and four unit cubes to Lilly's model.  
 (C) Add three ten rods and two unit cubes to Lilly's model.  
 (D) Add one hundred flat, two ten rods, and four unit cubes to Lilly's model.

9. Which of the following expressions can be factored to show students how to use the associative property of multiplication?

- (A)  $2 \times 7$
- (B)  $5 \times 17$
- (C)  $10 \times 21$
- (D)  $11 \times 23$

10.



Which **TWO** of the following word problems are best modeled by the preceding figure?

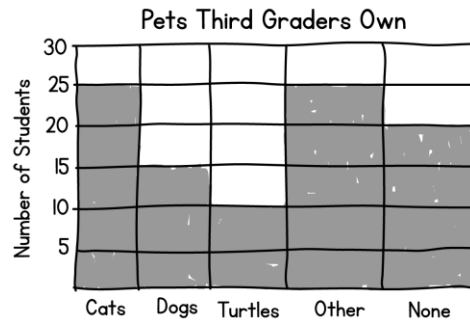
- (A) If five students each have four marbles, how many marbles do the students have altogether?
  - (B) If twenty crayons are to be shared equally by four students, how many crayons will each student get?
  - (C) If a plant costs \$5 and James has \$20 to spend, how many plants can James buy?
  - (D) If Ruth has twenty grapes and eats five of them, how many grapes does Ruth have left?
  - (E) If four books are sold in a slipcase, how many slipcases are needed to hold twenty-four books?
11. The number of visitors per quarter to the Homework Help Web site is shown in the following table.

Quarter of the Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Visitors
Number of Visitors	8	32	128		680

Based on the geometric pattern in the number of visitors shown in the table, what was the number of visitors to the Homework Help Web site in the fourth quarter of the year?

- (A) 170
- (B) 460
- (C) 512
- (D) 552

12. A third-grade class creates the bar graph shown using data from a grade-level poll about the types of pets third graders own.



Once the graph is drawn, the teacher asks students to make inferences based on the information in the graph. Which of the following student inferences can be justified by using the information in the graph?

- (A) Nineteen students in the third grade responded to the poll.
- (B) A student who owns a cat does not own a dog or a turtle.
- (C) Some students have no pets because they do not like animals.
- (D) More students own a cat than own no pet.
13. Which of the following is a correct step in evaluating the expression  $21 \div 7 \times (5 - 2) + 9 - 7$  using the order of operations?
- (A)  $21 \div 21 + 9 - 7$
- (B)  $3 \times 3 + 9 - 7$
- (C)  $3 \times (5 - 2) + 2$
- (D)  $21 \div 7 \times 5$



14. A teacher places a three-dimensional shape on a table, and students identify the following features of the shape.

- Has one base
- Has six edges
- Has four vertices
- Has three triangular faces

Based on the list of features, the students are examining which of the following shapes?

- (A) A cone
- (B) A cylinder
- (C) A triangular pyramid
- (D) A triangular prism

15. **Problem:** Sandy has four more crayons than Peter. Sandy has nine crayons. How many crayons does Peter have?

Which of the following types of problem situations is best illustrated by the preceding problem?

- (A) Joining
- (B) Separating
- (C) Comparing
- (D) Multiplying

## Science Sample Questions

16. Which of the following is an example of a hypothesis?

- (A) As one solution was added to another solution, bubbles appeared.
- (B) After sitting for a period of time, a clear liquid turned red.
- (C) When vinegar is added to baking soda, bubbles will be produced.
- (D) After some salt was dissolved in water, the mass of the resulting solution increased by 10 grams.

17. Of the following, which is the best example of a theoretical model?
- (A) A representation to describe a molecule
  - (B) A scaled-down structure identical to an existing larger structure
  - (C) A toy car
  - (D) A sculpture of a person
18. Which of the following describes the density of an object?
- (A) The amount of space occupied by an object
  - (B) The weight of an object on Earth
  - (C) The ratio of an object's mass to its volume
  - (D) The temperature at which a substance begins to melt
19. When a swimmer pushes off the wall of a swimming pool, exerting a force on the wall, the wall exerts an equal and opposite force back on the swimmer, pushing the swimmer forward. This is an example of which of the following?
- (A) Universal gravitation
  - (B) Inertia
  - (C) The law of conservation of energy
  - (D) Newton's third law of motion
20. Which of the following is true about all of the planets in our solar system?
- (A) They have rocky surfaces and are known as terrestrial planets.
  - (B) They orbit the Sun in appropriately the same amount of time.
  - (C) They are at varying distances from the Sun.
  - (D) They are approximately the same size.
21. Very high ocean waves arriving onshore that were caused by an earthquake or a volcanic eruption under the sea are
- (A) monsoons
  - (B) tsunamis
  - (C) neap tides
  - (D) inshore waves

22. A warm-blooded vertebrate animal with hair and mammary glands is a

- (A) bird
- (B) fish
- (C) amphibian
- (D) mammal

23. Which **THREE** of the following statements about genes are true?

- (A) Genes are a major source of cellular energy.
- (B) Genes are located on chromosomes.
- (C) Genes are composed of DNA.
- (D) Genes are the functional units of heredity.

## Mathematics and Science Answers

- The correct answer is (D). The activity has students decomposing their numbers into units, tens, and hundreds. Choice (A), comparing quantities, is incorrect because each student has only one number to work with. Choice (B), describing quantities, refers to providing more information such as whether the numbers are even or odd or multiples of other numbers. Choice (C), ordering quantities, is incorrect because the students are working with only one number.
- The correct answer is (A). The question tests your knowledge of strategies for relating a fraction to division. The numbers used in the problem described are whole numbers, so the problem builds on students' previous experience working with whole numbers. The amount that each child would get can be expressed as  $1 \div 5$ . Dividing the bottle of juice into 5 allows a sharing interpretation for division to be used to show that each child will get  $\frac{1}{5}$  of the bottle. This shows that  $\frac{1}{5}$  and  $1 \div 5$  both represent 1 divided by 5.
- The correct answer is (B). The answer 8 is found by subtracting 7 from 15.
- The correct answer is (B). The question tests your knowledge of converting between fractions and decimals. 8 or  $\frac{2}{5}$  of the 20 students in the bus are in first grade, while  $\frac{1}{5}$  or 4 of the students are in second and third grade. The total number of first-, second-, and third-grade students in the bus is 12, and the number of students left,  $20 - 12 = 8$ , is the number of students in fourth grade. Eight students out of twenty is the same as  $\frac{8}{20} = \frac{2}{5} = 0.4$ .
- The correct answer is (C). To find the difference in the heights of the trees, convert 17 feet 4 inches to 16 feet 16 inches and subtract 7 feet 8 inches. The result is 9 feet 8 inches.
- The correct answer is (B). Standard units of measurement are universally available and are the same size in all contexts, while nonstandard units are invented measures that are not considered accepted standards of measurement (for example, pencils, shoes, or blocks). Choice (A) is incorrect because it does not involve any measurement but requires students to stand in order of height. Choices (C) and (D) are incorrect because they involve standard units of measurement.
- The correct answer is (C). By asking the students to select identical, equal-sized pieces such as  $\frac{1}{4}$  that when used together can represent the fraction  $\frac{1}{2}$ , the students learn about the concept of equivalent fractions. The activity in the scenario does not support ordering unit fractions (A), adding rational numbers (B), or converting fractions to percents (D).
- The correct answer is (A). Pete and Lilly are asking classmates to find 32 times 7, which equals 224. Lilly's original model represents 203. It therefore needs two ten rods and one unit cube added to it so that it represents 224.

9. The correct answer is (C). The associative property states that numbers can be multiplied regardless of how the numbers are grouped. The expression  $10 \times 21$  can be factored in the following way, and the factors can be regrouped to illustrate the associative property of multiplication:  $10 \times 21 = (2 \times 5) \times 21 = 2 \times (5 \times 21) = 2 \times 105$ . The expressions in (A), (B), and (D) contain prime numbers that cannot be factored and regrouped.
10. The correct answers are (B) and (C). The model represents partitive division, which is the sharing of a quantity equally. Choice (A) is a multiplication problem. Choice (D) is a subtraction problem. Choice (E) is a quotative division problem involving twenty-four not twenty items.
11. The correct answer is (C). The table shows that the number of visitors in the second quarter was 32, or four times the number of visitors in the first quarter, and that the number of visitors in the third quarter was 128, or four times the number of visitors in the second quarter. Based on the geometric pattern in the table, the number of visitors in the fourth quarter was 512, or four times the number of visitors in the third quarter.
12. The correct answer is (D). Based on the information in the graph, 25 third graders own cats and 20 own no pet. More students own a cat than own no pet. Choice (A) is not correct because each shaded block represents five students, not one student. Choices (B) and (C) are not correct because there is not enough information in the table to draw those inferences.
13. The correct answer is (B). Do the arithmetic in the expression in this order: working repeatedly from left to right, first clear all parentheses, next compute any exponents, then multiply and divide, and finally add and subtract.  $21 \div 7 \times (5 - 2) + 9 - 7 = 21 \div 7 \times 3 + 9 - 7 = 3 \times 3 + 9 - 7 = 9 + 9 - 7 = 18 - 7 = 11$ .
14. The correct answer is (C). A triangular pyramid has a triangle as a base, three triangular faces, six edges, and four vertices. Choices (A) and (B) are incorrect because neither a cone nor a cylinder has six edges. Choice (D) is incorrect because a triangular prism has nine edges and six vertices.
15. The correct answer is (C). Comparison word problems involve thinking about how many more or fewer items are in one set than are in another set. In this case, the problem requires comparing Sandy's set of nine crayons to a set that has four fewer crayons. Making the comparison tells us that Peter has five crayons. Choice (A) refers to addition. Choice (B) refers to subdividing. Choice (D) refers to multiplication.
16. The correct answer is (C). A hypothesis is a supposition or proposed explanation as a starting point for further investigation and testing. The supposition that must be tested is whether bubbles will be produced when vinegar is added to baking soda. The other choices are observations.
17. The correct answer is (A). A theoretical model is a symbolic representation of a theory or hypothesis used to describe or explain phenomena that cannot be directly observed. The constraints can

be related to the size of the objects or systems represented, or to the time scales of the processes that take place. A representation of a molecule is an example of a theoretical scientific model.

18. The correct answer is (C). Density is equal to the mass of an object divided by its volume. Therefore, density is the ratio of the mass of an object to its volume.
19. The correct answer is (D). Newton's third law of motion states that a pair of forces (an action-reaction force pair) describes the interaction between two objects: the first object exerts a force on a second object and the second object exerts a force of equal magnitude and opposite direction on the first object.
20. The correct answer is (C). The planets in our solar system are at varying distances from the Sun.
21. The correct answer is (B). Tsunamis are waves caused by earthquakes or volcanic eruptions under the sea that arrive as very high waves onshore.
22. The correct answer is (D). A warm-blooded vertebrate animal with hair and mammary glands is a mammal. The correct answers are (B), (C), and (D). Genes are located on chromosomes, are composed of DNA, and are the functional units of heredity.
23. The correct answers are (B), (C), and (D). Genes are located on chromosomes, are composed of DNA, and are the functional units of heredity.

## Understanding Question Types

The *Praxis* assessments include a variety of question types: constructed response (for which you write a response of your own); selected response, for which you select one or more answers from a list of choices or make another kind of selection (e.g., by clicking on a sentence in a text or by clicking on part of a graphic); and numeric entry, for which you enter a numeric value in an answer field. You may be familiar with these question formats from taking other standardized tests. If not, familiarize yourself with them so you don't spend time during the test figuring out how to answer them.

### Understanding Selected-Response and Numeric-Entry Questions

For most questions, you respond by clicking an oval to select a single answer from a list of answer choices.

However, interactive question types may also ask you to respond by:

- Selecting more than one choice from a list of choices
- Typing in a numeric-entry box When the answer is a number, you may be asked to enter a numerical answer Some questions may have more than one entry box to enter a response
- Selecting parts of a graphic. In some questions, you will select your answers by clicking on a location (or locations) on a graphic such as a map or chart, as opposed to choosing your answer from a list
- Selecting sentences. In questions with reading passages, you may be asked to choose your answers by selecting a sentence (or sentences) within the reading passage
- Dragging and dropping answer choices into targets on the screen You may be asked to select answers from a list of choices and to drag your answers to the appropriate location in a table, paragraph of text or graphic
- Selecting answer choices from a drop-down menu You may be asked to choose answers by selecting choices from a drop-down menu (e.g., to complete a sentence)

Remember that with every question you will get clear instructions.

## Understanding Constructed-Response Questions

Constructed-response questions require you to demonstrate your knowledge in a subject area by writing your own response to topics. Essays and short-answer questions are types of constructed-response questions.

For example, an essay question might present you with a topic and ask you to discuss the extent to which you agree or disagree with the opinion stated. You must support your position with specific reasons and examples from your own experience, observations, or reading.

Review a few sample essay topics:

- *Brown v. Board of Education of Topeka*

"We come then to the question presented: Does segregation of children in public schools solely on the basis of race, even though the physical facilities and other 'tangible' factors may be equal, deprive the children of the minority group of equal educational opportunities? We believe that it does"

- A. What legal doctrine or principle, established in *Plessy v. Ferguson* (1896), did the Supreme Court reverse when it issued the 1954 ruling quoted above?
  - B. What was the rationale given by the justices for their 1954 ruling?
- *In his self-analysis, Mr. Payton says that the better-performing students say small-group work is boring and that they learn more working alone or only with students like themselves. Assume that Mr. Payton wants to continue using cooperative learning groups because he believes they have value for all students.*
    - Describe **TWO** strategies he could use to address the concerns of the students who have complained.
    - Explain how each strategy suggested could provide an opportunity to improve the functioning of cooperative learning groups. Base your response on principles of effective instructional strategies.
  - *"Minimum-wage jobs are a ticket to nowhere. They are boring and repetitive and teach employees little or nothing of value. Minimum-wage employers take advantage of people because they need a job."*
    - Discuss the extent to which you agree or disagree with this opinion. Support your views with specific reasons and examples from your own experience, observations, or reading.



Keep these things in mind when you respond to a constructed-response question:

1. **Answer the question accurately.** Analyze what each part of the question is asking you to do. If the question asks you to describe or discuss, you should provide more than just a list.
2. **Answer the question completely.** If a question asks you to do three distinct things in your response, you should cover all three things for the best score. Otherwise, no matter how well you write, you will not be awarded full credit.
3. **Answer the question that is asked.** Do not change the question or challenge the basis of the question. You will receive no credit or a low score if you answer another question or if you state, for example, that there is no possible answer.
4. **Give a thorough and detailed response.** You must demonstrate that you have a thorough understanding of the subject matter. However, your response should be straightforward and not filled with unnecessary information.
5. **Take notes on scratch paper** so that you don't miss any details. Then you'll be sure to have all the information you need to answer the question.
6. **Reread your response.** Check that you have written what you thought you wrote. Be sure not to leave sentences unfinished or omit clarifying information.

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