

Elementary Education

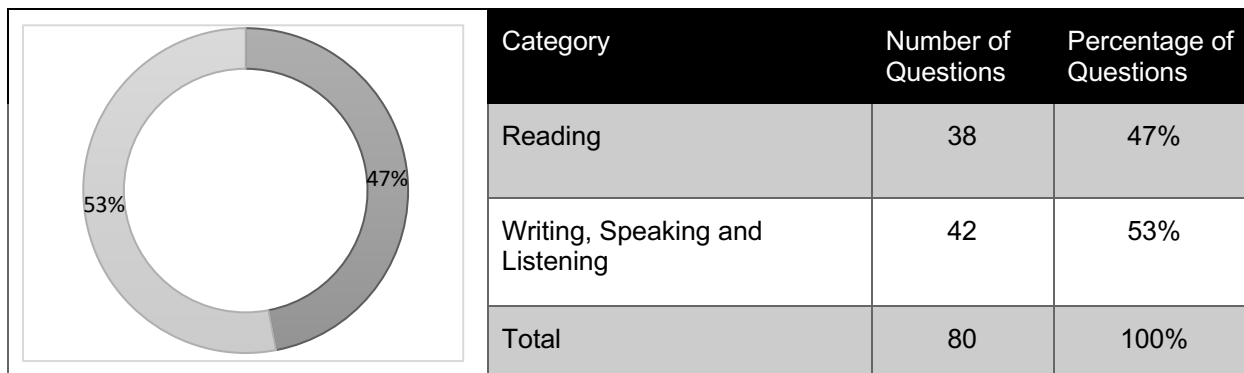
Webinar Study Guide



PRAXIS ELEMENTARY EDUCATION MULTIPLE SUBJECTS

Test Breakdown		
Subtests	Number of minutes	Approximate number of questions
5002 Reading and Language Arts	90	80
5003 Mathematics	65	50
5004 Social Studies	60	60
5005 Science	60	55

Subtest 1 – Reading and Language Arts



READING

ORAL LANGUAGE

The first part of literacy is oral language. We learn to listen and speak before we learn to read and write. Oral language consists of 6 major areas: phonology, vocabulary, morphology, grammar, pragmatics, and discourse.

- **Phonology** encompasses the organization of sounds in language.
- **Vocabulary** (semantics) encompasses both expressive (speaking) and receptive (listening) vocabulary.
- **Morphology** encompasses the smallest units of meaning in words.
- **Grammar** (syntax) is the structure of language and words.
- **Pragmatics** focuses on the social cues or norms in language. This is often referred to as situations in language.
- **Discourse** focuses on speaking and listening skills in language.

WORD RECOGNITION

Phonemic awareness refers to the skills that identify and manipulate sounds in words. When you think phonemic awareness, think sounds only. For example, if students are recognizing individual sounds in words or blending sounds in words without having to see the word, it is phonemic awareness.

Phonics is understanding the rules of language. Students have to see the letters or words to engage in phonics. For example, in the word **receive**, students know the *c* makes an /s/ sound. They have to look at the letter *c* and understand that it is followed by an *e*, *i*, or *y*, and therefore, makes an /s/ sound. As students begin to read, they use different methods to figure out words.

Phonemic Awareness	Phonics
Focus on phonemes/sounds	Focus on graphemes/letters and their corresponding sounds
Spoken language	Written language/print
Mostly auditory	Both visual and auditory
Manipulating sounds in words	Reading and writing letters according to sounds, spelling, patterns, and phonological structure

CUEING SYSTEMS

Cueing systems allow students to use their background knowledge (schema) and apply that to understanding words. There are several types of cues students use when they read.

Semantic Cues

Semantic cues refer to the meaning in language that assists in comprehending texts including words, speech, signs, symbols, and other meaning-bearing forms. Semantic cues involve the learners' prior knowledge of language. Gradually, students independently relate new information to what is known and personally meaningful.

Example: We were so hungry we had a **picnic** in the park.

Picnic is a strange word, but the student can use the words *hungry* and *park* to figure out the word *picnic*.

Syntactic Cues

Syntactic cues involve the structure of the word as in the rules and patterns of language (grammar), and punctuation. As students read, they use structural cues.

Example: The student reads, "Joey **sit** in class yesterday."

In this case, the student mistakes the word *sit* for *sat*. Using syntactic cuing, the student will self-correct because the word *yesterday* indicates there needs to be a past tense verb—*sat*.

Graphophonic Cues

Graphophonic cues involve the letter-sound or sound-symbol relationships of language. Readers identifying unknown words by relating speech sounds to letters or letter patterns are using graphophonic cues. This process is often called decoding.

Example: The student knows that the word *make* has a long *a* sound because of the vowel after the *k*. This is a consonant, vowel, consonant, vowel (CVCV) word.

FLUENCY

Prosody – comprises timing, phrasing, emphasis, and intonation that readers use to help convey aspects of meaning and to make their speech lively. Prosody includes stopping at periods, pausing at commas, reading with inflection, and reading with expression.

Automaticity – is the fast, effortless word recognition that comes with repeated reading practice. When students are reading at > 95% accuracy, they have automaticity.

Accuracy – is the amount of words a student reads correctly. Typically, accuracy is measured by having students read aloud during a fluency read (also called a running record). The student reads and the teacher marks any words the student miscues.

Rate – is the speed at which students read words correctly. Rate is typically expressed in correct words per minute (wpm).

READING COMPREHENSION

Critical Thinking. This is multi-step, high-level thinking. Students are stretching in their thinking to analyze, evaluate, interpret, and synthesize information to reach a conclusion or make a judgment.

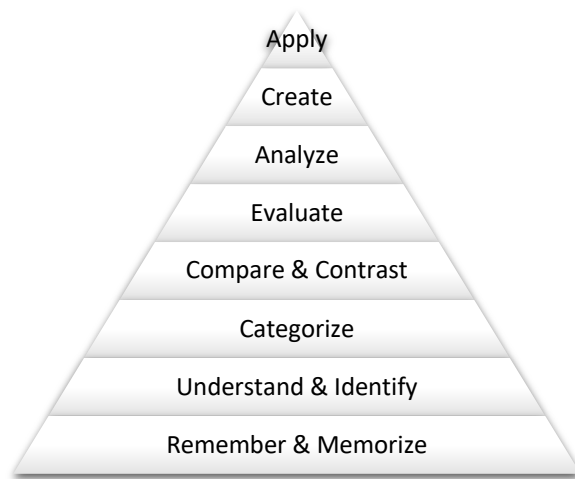
Creative Thinking. This requires students to create something by applying their skills. When students apply their skills, they are operating at a high cognitive level.

Reflective Thinking. Students look back on and reflect upon their learning process to promote abstract thinking and to encourage the application of learning strategies to new situations.

CRITICAL THINKING

Bloom's Taxonomy is a hierarchical model used to classify educational learning objectives into levels of complexity and specificity. The higher up the pyramid, the more complex the thinking skills. The skills are represented as verbs on the pyramid. When answering questions on the test regarding critical thinking, reference Bloom's Taxonomy. The following pyramid is a modified version of Bloom's Taxonomy. We have modified it to include other skills (verbs) you may see on the exam.

The skills (verbs) at the highest points of the pyramid are evaluate, analyze, create, and apply. When you are faced with a critical thinking problem on the test, visualize this pyramid, and look for answer choices that reflect the higher portions of the pyramid.



(Modified Bloom's Taxonomy)

Metacognition is thinking about thinking. When students have metacognition, they understand the processes in their minds and can employ a variety of techniques to understand text.

Strategies for boosting **comprehension**, **critical thinking**, and **metacognition** are:

- **Predicting.** Asking students what they think will happen next.
- **Questioning.** Having students ask questions based on what they are reading.
- **Read aloud/think aloud.** Teacher or student reads and stops to think aloud about what the text means.
- **Summarizing.** Asking students to summarize what they just read in their own words.

WRITING SPEAKING & LISTENING

Stages of Writing	
Preliterate to Emergent	
Scribbling	Random marks or scribbles often occur on a page with drawings. Children may say, "This says Tommy!" (child's own name). Toddlers use the terms <i>drawing</i> and <i>writing</i> to describe their marks; however, 3- and 4-year-olds generally understand the difference between the two.
Emergent	
Mock Handwriting or Wavy Scribble	Children produce lines of wavy scribbles as they imitate adult cursive writing. Children will often pretend they are writing something they have seen their parents write such as a grocery list or a letter.
Mock Letters	Children attempt to form alphabetic representations, which also often appear in their drawings. Writing in this stage is often vertical versus horizontal. Children make shapes that resemble conventional letters.
Transitional	
Conventional Letters	Children begin to write letters, usually from their name or a family member's name. As children's mock letters become more and more conventional, real letters of the alphabet begin to appear. Children will often create strings of letters across a page and "read" them as real sentences or a series of sentences.
Invented Spelling (also known as Approximated Spelling)	Children write words using phonemic awareness. The words are not spelled correctly but do resemble the sounds of the words. For example, invented spelling of the word <i>was</i> may be <i>wuz</i> , or the invented spelling of the word <i>other</i> may be <i>uther</i> .
Fluent	
Conventional Spellings	Children's approximated spellings gradually become more and more conventional. The child's own name is usually written first, followed by words such as <i>mom</i> , <i>dad</i> , and <i>love</i> . Initially, children may incorrectly copy words. Eventually, words will be written correctly. Adults can support the child's move to conventional spelling by being patient and by continuing to serve as a good writing model.

MODES OF WRITING

There are four main modes of writing:

Opinion/argumentative – Writing that persuades or convinces using support, details, and examples from the text in logical order. In early grades, this is called *opinion writing*.

Informative/explanatory – Writing that informs, explains, or tells "how to" without using opinions (just the facts).

Descriptive – Writing that describes or helps form a visual picture using sensory details and spatial order.

Narrative – A first-person account that tells a story as it happens using sensory details and chronological order.

STAGES OF THE WRITING PROCESS

1. **Pre-writing** – Brainstorming, considering purpose and goals for writing, using graphic organizers to connect ideas, and designing a coherent structure for a writing piece.
2. **Drafting** – Working independently to draft the sentence, essay, or paper.
3. **Peer review** – Students evaluate each other's writing in the peer review process.
4. **Revising** – Reworking a piece of writing based on structure, tone, and clear connections.
5. **Editing** – Editing based on conventions and mechanics.
6. **Rewriting** – Incorporating changes as they carefully write or type their final drafts.
7. **Publishing** – Producing and disseminating the work in a variety of ways, such as a class book, bulletin board, letters to the editor, school newsletter, or website.

APPROPRIATE MODES OF WRITING

According to the Common Core State Standards (2019), students must demonstrate the following:

- Adapt their communication in relation to audience, task, purpose, and discipline.
- Set and adjust purpose from reading, writing, speaking, listening, and language use as warranted by the task.
- Appreciate nuances, such as how the composition of an audience should affect tone when speaking and how the connotations of words affect meaning.
- Know that different disciplines call for different types of evidence.

3 ELEMENTS THAT SHAPE THE CONTENT IN A PIECE OF WRITING:

1. **Tone** refers to the overall feeling of the piece of writing. When writing a narrative vs. an opinion, the tone or position may be different depending on the content. The tone will convey a specific attitude toward the audience and the subject (Darling, n.d). For example, *Pete the Cat* by Eric Litwin and James Dean expresses an optimistic tone. Pete the Cat runs into various obstacles but is able to prevail by having a positive attitude.
2. **Purpose** refers to the reason for the piece of writing. Is the student writing to persuade, to entertain, or to explain? For example, if a student is writing her state representative to pass a new law, the student should write a persuasive essay. However, if a student is writing to her grandmother to describe how summer camp is going, the student should write a narrative. Establishing a purpose for the piece of writing is an important step in the writing process.
3. **Audience** refers to the individuals the writer expects to read the piece of writing. As explained above, a student will write very differently in a letter to her grandmother than she will in a letter to her congressional representative. Understanding the audience is a key component of the writing process.

WRITING CONVENTIONS

On the test, you might be asked to identify errors in student writing. You might also be asked to provide appropriate feedback on student writing. The questions will contain basic grammar errors. Below is a list of grammar expectations for elementary students.

- **Parts of Speech** – Noun, verb, adjective, adverb
- **Fragments** – Non-sentences, phrases that do not have a subject and a predicate
- **Subject verb agreement** – The subject and the predicate must agree. For example, *the girl run to the car* should be *the girl runs to the car*.

READING & LANGUAGE ARTS – PRACTICE TEST

1. When a student has awareness of phonemes in words, syllables, onset-rime segments, and spelling, he or she is demonstrating:
 - A. Phonological awareness
 - B. Phonics mastery
 - C. Phonemic awareness
 - D. Structural analysis
2. Phonemic awareness includes the ability to:
 - A. Form compound words and combine word parts
 - B. Spell accurately and decode unfamiliar words
 - C. Pronounce individual sounds in words
 - D. Differentiate between homonyms and spell accurately
3. Based on the following instructional practices, what type of lesson is the teacher working on?
 - Teach students to break words down by individual sounds.
 - Teach students to focus on sounds as they rhyme words.
 - A. Phonemic awareness
 - B. Decoding
 - C. Phonics
 - D. Structural analysis
4. A student is writing words, reproduced below. The student is using what type of writing?

We went to the uthur gas stashtun.

- A. Conventional spelling
 - B. Inventive spelling
 - C. Mock letters
 - D. Fluent writing
5. Which of the following would be the most appropriate example of persuasive writing?
 - A. As she walked through the room, she remembered her childhood and was transported back in time.
 - B. Picturesque mountains and pristine grass are the backdrop to the beautiful 19th century campus.
 - C. In 1969, the United States made it to the moon, making the U.S. the most powerful nation in the world.
 - D. This is the most pressing issue of our time, and young people should get out and vote.

6. Match the stage of writing to the activity.

1.	writing strings of words
2.	writing his or her name
3.	scribbling in a pattern
4.	scribbling randomly

A.	preliterate
B.	emergent
C.	transitional
D.	fluent

7. A teacher notices a few students are not motivated to read the current section of a piece of informational text. What can the teacher do to motivate students to engage in the reading?
- Allow students to partner-up and read the text with a buddy.
 - Reward the students with extra time in the computer lab for finishing the reading.
 - Require the students to finish the reading for homework
 - Allow the students to self-select books from a standards-aligned group of informational texts.
8. A teacher is helping students use the semantic cueing system. Which of the following questions aligns with the semantic cueing system?
- Is that structured properly?
 - Does that make sense?
 - What sound does that letter make?
 - Is that a long /a/ sound or short /a/ sound?

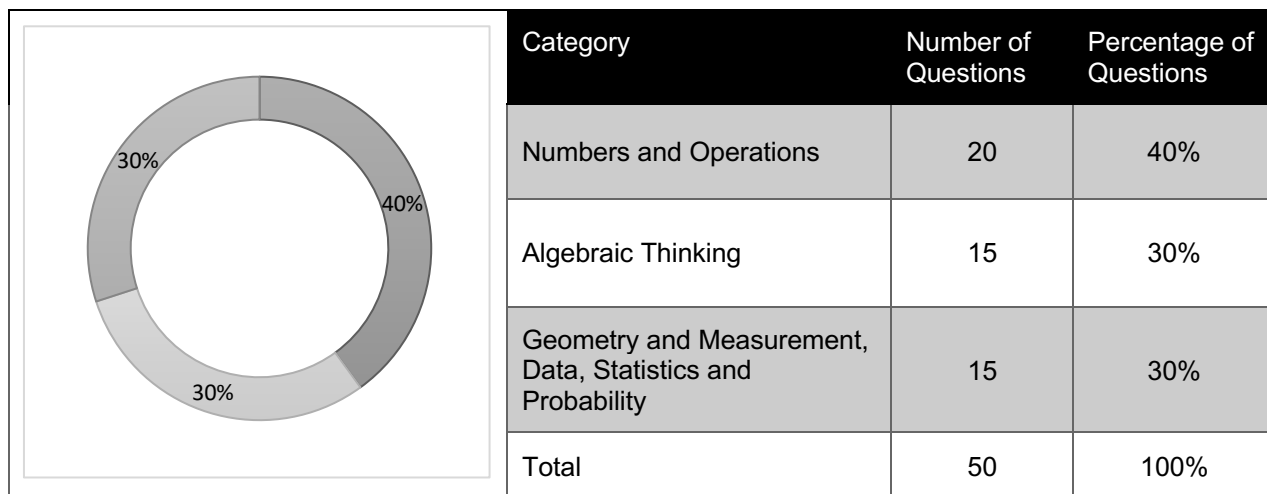
Use the following paragraph to answer the question below

1) The American alligator is a reptile. 2) The American alligator is an apex predator. 3) An apex predator is a predator at the top of the food chain. 4) Other apex predators are lions and tigers. 5) The American alligator lays eggs in sticks, leaves and mud.

9. What would be appropriate feedback to share with the student who wrote the paragraph above?
- "You use the term American alligator a lot. Try combining sentences to give the paragraph varied language."
 - "Good job! Keep up the great work!"
 - "Consider using a closing statement at the end."
 - "Your writing does a great job describing your knowledge about the American alligator. Consider deleting sentence 4 so it doesn't take away from your overall theme."
10. Which of the following is considered a best practice when planning lessons for ELLs?
- Using the WIDA standards to guide pedagogy and practice with ELLs.
 - Using the Internet to research exciting activates for students who are learning English.
 - Consult with a peer teacher who has experience with ELL instruction.
 - Group all ELL students together to apply interventions effectively.

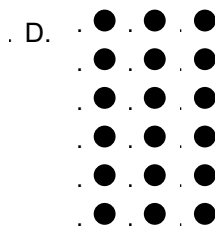
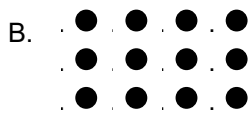
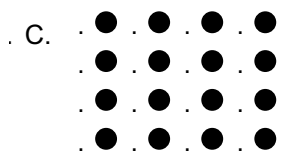
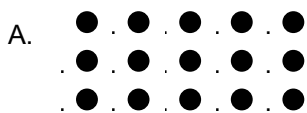
Number	Answer	Explanation
1.	A	All these individual skills fit under the umbrella of phonological awareness. Phonological awareness is a broad set of skills that includes identifying and manipulating units of oral language—parts such as phonemes in words, syllables, and onsets and rimes. Students with phonological awareness also understand conventional spelling. Remember, phonemic awareness is a sub-skill of phonological awareness and only deals with the smallest unit of sound—the phoneme. Signs of strong phonemic awareness include being able to hear rhyme and alliteration. Although they are often used interchangeably, when talking about reading skills, phonological awareness is usually the correct term.
2.	C	Phonemic awareness is understanding the individual sounds—or phonemes—in words. When you see the word <i>phonemic</i> , think of the root word <i>phone</i> , which is related to sound. Answers A, B, and D all reference words and spelling, which is connected to phonics.
3.	A	Working with individual sounds in words is phonemic awareness. Answers B, C, and D all focus on phonics, which means students have to see the words and apply spelling rules. That is not what's happening in the activities listed.
4.	B	The student is spelling phonetically (using sounds in the words). This is called inventive spelling and is an essential part of developing writing skills.
5.	D	Answer A is narrative. Answer B is descriptive. Answer C is informational. Answer D is persuasive. The words <i>most pressing issue of our time</i> are claim-based and persuasive.
6.	1-D 2-C 3-B 4-A	See Stages of writing chart in the study guide.
7.	D	The first thing to notice about this answer choice is the term <i>standards aligned</i> . If you see a reference to the standards in an answer choice it is probably the correct answer. Next, consider if <i>intrinsic motivation</i> is the best answer here. Allowing students to self-select books increases intrinsic motivation. All the other answer choices focus on extrinsic motivators and requirements, which are not as effective as intrinsic motivators
8.	B	Semantic cueing system is using meaning to understand. Therefore, the question, “Does that make sense?” is the most appropriate here. Answer A has to do with a syntactic cuing system. Answers B and D are letter-sound relationships, which is graphophonic cueing system.
9.	D	When giving feedback on student writing, always start with a positive comment first, and then suggest ways to strengthen the piece. Answer D does that.
10.	A	WIDA is the authority on ELL education and second language acquisition.

Subtest 2 – Mathematics



NUMBERS AND OPERATIONS

1. Which of the following best depicts why $3 \times 5 = 15$?



2. A softball team is selling candles in boxes of 6. They make a profit of \$2.75 for each candle they sell. If they want to make enough money to cover the \$825 entry fee for a softball tournament, how many boxes of candles do they need to sell?
- A. 300
B. 138
C. 50
D. 17
3. The cost of 4 notebooks is \$5. Which expression below represents the cost of 7 notebooks?
- A. $7 \text{ notebooks} \times \frac{4 \text{ notebooks}}{\$5}$
B. $4 \text{ notebooks} \times \frac{7 \text{ notebooks}}{\$5}$
C. $7 \text{ notebooks} \div \frac{4 \text{ notebooks}}{\$5}$
D. $7 \text{ notebooks} \times \frac{\$5}{4 \text{ notebooks}}$

4. Ryan works at a sandwich shop and can make 35 sandwiches in 50 minutes. At this rate, how many sandwiches can he make in a 4-hour shift?
- A. 168
 - B. 170
 - C. 280
 - D. 342

ALGEBRAIC THINKING

5. Evaluate the equation for $b = -4$.
- $$-b^2 - 3b$$
- A. -28
 - B. -4
 - C. 4
 - D. 28
6. Forrest is performing a magic trick and tells his friends to do the following:
- i. Think of a number.
 - ii. Subtract seven from that number.
 - iii. Divide your answer by five.
 - iv. Cube the result.

Which of the following could be used to represent these steps?

- A. $(n - 7 \div 5)^3$
 - B. $(7 - n) \div 5^3$
 - C. $\left(\frac{n-7}{5}\right)^3$
 - D. $\frac{(n-7)^3}{5}$
7. A six-sided cube has the numbers 1–6 on the sides. If the cube is rolled four times, and a 5 is rolled each time, what is the probability of the cube landing on a 5 on the fifth roll??
- A. $\frac{1}{6}$
 - B. $\frac{1}{4}$
 - C. $\frac{1}{3}$
 - D. $\frac{1}{2}$

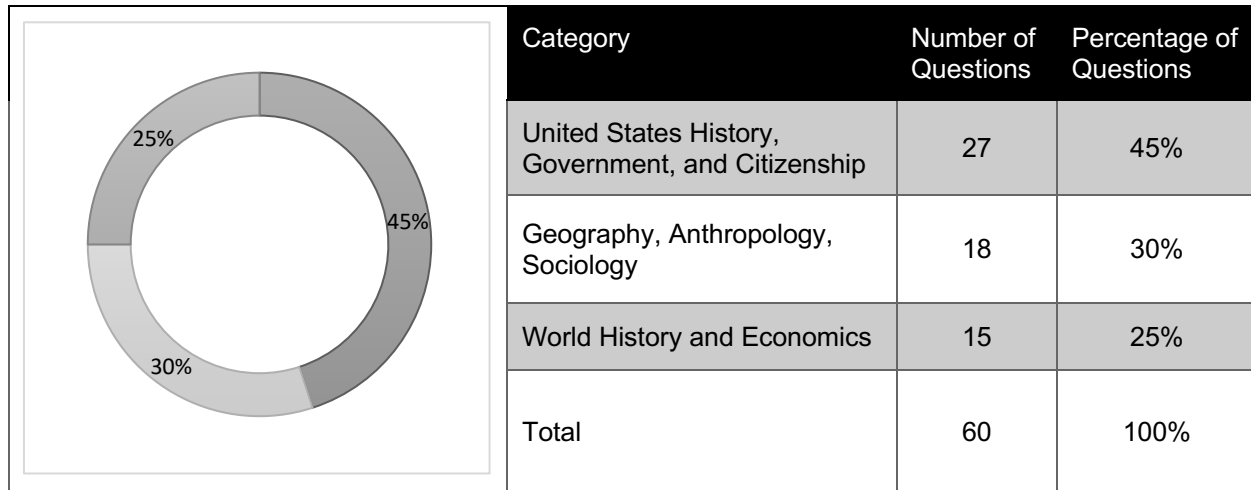
GEOMETRY AND MEASUREMENT, DATA, STATISTICS AND PROBABILITY

8. What is the perimeter of a square with an area of 49 square inches?
- A. 7 inches
 - B. 14 inches
 - C. 21 inches
 - D. 28 inches
9. Ellie's food truck currently serves 4 main dishes and 3 side dishes, and each meal consists of 1 main dish and 1 side. Next week she is adding 1 main dish and 2 sides to the menu. How many more combinations of meals will her customers be able to get with the new additions?
- A. 2
 - B. 13
 - C. 14
 - D. 25
10. Which of the following could be the height of a front door to a residential home?
- A. 24 meters
 - B. 244 mm
 - C. 2 km
 - D. 244 cm

Number	Answer	Explanation
1.	A	The concrete representation of the multiplication problem 3×5 is a picture or array of 3 groups of 5 items. The array in option A contains 3 rows, each with 5 dots.
2.	C	<p>First find the profit for 1 box of candles. There are 6 candles in a box, and each candle sold makes a profit of \$2.75. Therefore, the profit for a box is $6 \times \\$2.75 = \\16.50.</p> <p>Next, \$16.50 times an unknown number of boxes has to equal \$825 tournament fee. Write as an equation and solve for x, the number of boxes needed.</p> $16.50x = 825$ $\frac{16.50x}{16.50} = \frac{825}{16.50}$ $x = 50$ <p>Therefore, 50 boxes of candles need to be sold to reach the \$825 goal.</p> <p>Note: If you recognize that you divide 825 and 16.50 without having to write an equation, just do that math. Save yourself as much time as possible on this test!</p>
3.	D	Each of the answer choices multiplies a fraction by 7 notebooks. Therefore, the fraction must represent the cost per 1 notebook, which is found by dividing $\frac{\$5}{4 \text{ notebooks}}$.
4.	A	<p>The question gives a rate of 35 sandwiches in 50 minutes and asks for number of sandwiches in 4 hours. Because there is a rate in the problem, and the question asks for another rate, this can be solved using a proportion. Before writing the proportion, convert 4 hours to minutes, $4 \times 60 = 240$ minutes, so that the units in each fraction are the same. Next, set up a proportion with the given rate and solve for x.</p> $\frac{35 \text{ sandwiches}}{50 \text{ minutes}} = \frac{x \text{ sandwiches}}{240 \text{ minutes}}$ $50x = 240(35)$ $50x = 8,400$ $x = 168 \text{ sandwiches}$
5.	B	<p>When evaluating, be very careful with all the negative signs. Any time there is a negative sign in front of a variable to the second power, the number will always be negative. This is because $-x^2 = -1 \cdot x^2$, and with order of operations, the exponent always gets simplified first.</p> $-b^2 - 3b$ $= -(-4)^2 - 3(-4)$ $= -16 - 3(-4)$ $= -16 - (-12)$ $= -16 + 12 = -4$

Number	Answer	Explanation
6.	C	<p>The first step is to subtract 7 from n, or $n - 7$. Eliminate answer choice B because this option subtracts incorrectly. Next, the result of $n - 7$ is divided by 5, which means that $n - 7$ needs to be computed before dividing by 5. This eliminates answer choice A, because with order of operations, the 7 would be divided by 5 before the subtraction.</p> <p>Last, both the subtraction and division must occur before being cubed, which means that answer choice D can be eliminated, leaving answer choice C as the correct response.</p> <p>Note: <i>Putting an expression inside parentheses ensures that what is in the parentheses gets completed before what is outside the parentheses.</i></p>
7.	A	<p>The first four rolls of the number cube do not affect the fifth roll. Therefore, the probability of rolling a 5 is 1 out of 6, or $\frac{1}{6}$.</p>
8.	D	<p>Because a square has equal side lengths, the square with an area of 49 will have side lengths of 7 inches because $7 \times 7 = 49$ (recall the area of a square is $A = s \times s$).</p> <p>Thus, the perimeter of the square, $P = 4s$, is $P = 4 \times 7 = 28$ inches.</p>
9.	B	<p>To find the number of combinations, multiply the number of choices for each category.</p> <p>Before the additional items: $4 \times 3 = 12$</p> <p>After the additional items: $5 \times 5 = 25$.</p> <p>To find how many additional meal combinations can be made with the additions, subtract $25 - 12 = 13$.</p>
10.	D	<p>Answer choice D is most reasonable because 244 cm is 2.44 meters, which is about 2.5 yards, or 7.5 feet. That is a reasonable height of a door.</p> <p>Answer choice A is not reasonable because a meter is about a yard, so 24 meters would be way too tall.</p> <p>Answer choice B is not reasonable because it takes 1,000 mm to make 1 meter, making 244 less than a yard, which is way too short for a door.</p> <p>Answer choice C is not reasonable because 1 kilometer is almost a mile, so a door would not be measured in km.</p>

Subtest 3 – Social Studies



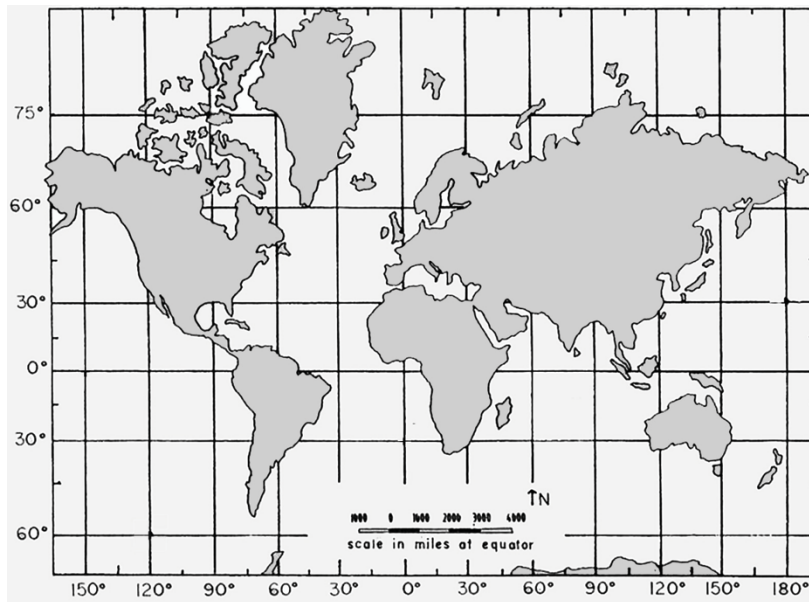
UNITED STATES HISTORY, GOVERNMENT, AND CITIZENSHIP

- Following the Louisiana Purchase, Thomas Jefferson ordered which of the following tasks to be completed?
 - Implementation of the Indian removal process
 - Reconstitution of the southern states
 - Exploration of the new territory
 - Initiation of the first U.S. census
- Which of the following describes the duty of the judicial branch of U.S. government?
 - Makes laws
 - Enforces laws
 - Interprets laws
 - Implements policy
- Which entity of U.S. government has the power to declare war?
 - Supreme Court
 - Congress
 - The House of representatives
 - The President
- What did Andrew Carnegie use the Bessemer steel process for?
 - Railroads
 - Canals
 - Irrigation systems
 - Assembly line

GEOGRAPHY, ANTHROPOLOGY, SOCIOLOGY

5. Using the map below, which country is at 60°N, 120°E?

- A. Russia
- B. South Africa
- C. Australia
- D. Canada



6. Which of the following terms is used to describe agriculture where large parcels of land are cultivated using machinery rather than manual labor?

- A. Intensive farming
- B. Sustenance farming
- C. Pastoral farming
- D. Extensive farming

7. Which of the following consists of a group of people that has a prominent ethnicity different from the surrounding community?

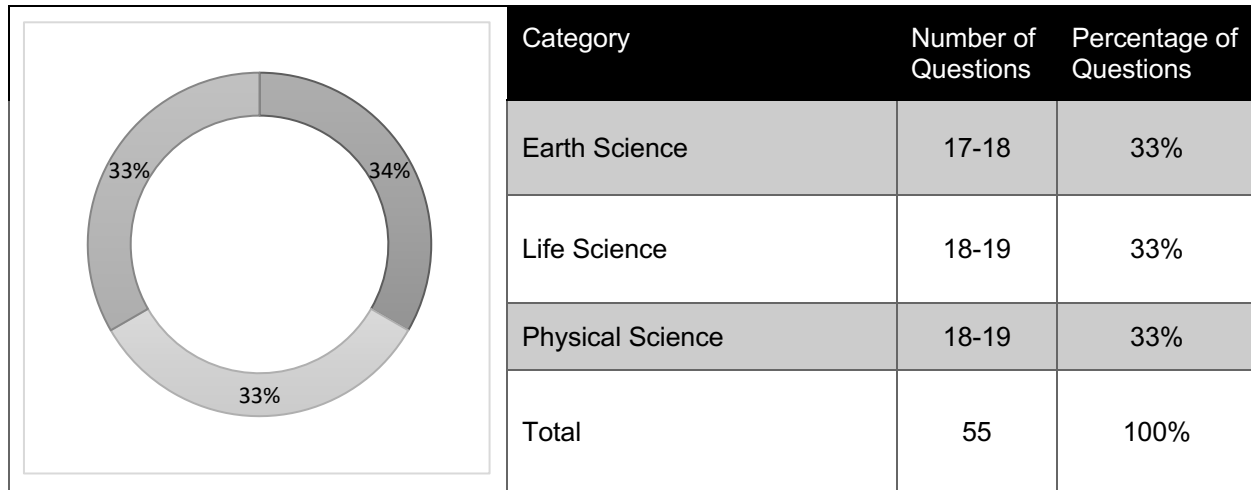
- A. An embassy
- B. An ethnic enclave
- C. A religious community
- D. A linguistic community

WORLD HISTORY AND ECONOMICS

8. Which of the following civilizations was the first to use irrigation?
 - A. Egypt
 - B. Mesopotamia
 - C. Pangea
 - D. Ancient Rome
9. Which of the following is an example of absolute advantage?
 - A. When a country produces goods at a lower opportunity cost than its competitors
 - B. When a country has an economic surplus and its trading partner has an economic shortage
 - C. When a country specializes in the product they are most efficient at producing and trades for products that other countries are most efficient at producing
 - D. When a country only exports products and does not import products
10. Which of the following strategies was used during the Cold War to stop the spread of communism?
 - A. Colonialism
 - B. Imperialism
 - C. Proliferation
 - D. Containment

Number	Answer	Explanation
1.	C	Thomas Jefferson instructed Meriwether Lewis and William Clark to explore the area from the recent Louisiana Purchase, also known as the Lewis and Clark Expedition.
2.	C	The judicial branch is responsible for interpreting laws and setting precedence. The legislative branch makes laws, and the executive branch enforces laws.
3.	B	While the president is the commander in chief of the U.S. armed forces, Article 1, Section 8 of the Constitution gives the legislative branch the power to decide when the United States goes to war.
4.	A	The Bessemer steel process was invented by British inventor Henry Bessemer and was instrumental in the American Industrial Revolution, especially in the railroad industry. Carnegie saw the process while visiting Europe and used the process in the United States to mass-produce steel for railroads.
5.	A	The point at 60 degrees north of the Equator and 120 degrees east of the Prime Meridian is in Russia.
6.	D	Extensive farming is where large land areas are farmed using low inputs of resources.
7.	B	An ethnic enclave is subsection of a community where the population is ethnically distinguished from the surrounding area. For example, a barrio is a Spanish-speaking area or neighborhood in a city.
8.	B	Irrigation was first used in Mesopotamia to move water through a series of bridges and canals to cultivate crops. Ancient Romans are the most famous for their complex aqueducts and irrigation systems. However, Mesopotamia invented the technology.
9.	C	Absolute advantage describes how countries can increase their wealth by specializing in producing and exporting goods they produce most efficiently.
10.	D	A component of the Cold War, containment was a response to a series of moves by the Soviet Union to enlarge its communist sphere of influence in Eastern Europe, China, Korea, and Vietnam.

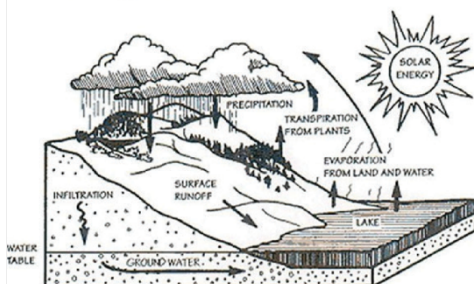
Subtest 4 – Science



EARTH SCIENCE

- How long does it take for Earth to go around the sun?
 - 24 hours
 - 30 days
 - 180 days
 - 365 days
- Where are aquifers located?
 - beneath Earth's crust
 - beneath the bedrock
 - in Earth's mantle
 - in Earth's core
- The picture below is an example of the:

Water Cycle



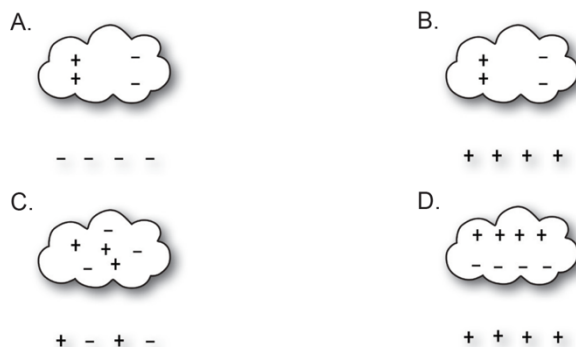
- Geosphere
- Hydrosphere
- Cryosphere
- Biosphere

LIFE SCIENCE

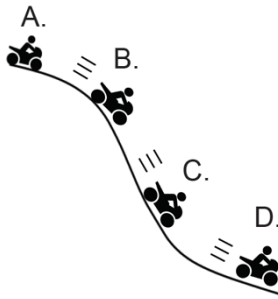
4. A eukaryote that does not make its own food and that does not contain cells with a cell wall is a(n):
- A. Animalia
 - B. Plantae
 - C. Protista
 - D. Algae
5. During this stage of mitosis, chromosomes line up in the middle of the cell and spindle fibers attach to the center of the chromosomes.
- A. prophase
 - B. metaphase
 - C. anaphase
 - D. telophase
6. Which of the following is a producer?
- A. grass
 - B. hawk
 - C. snake
 - D. bunny

PHYSICAL SCIENCE

7. In a glass of water, ice floats to the surface of the water. Why does this happen?
- A. The water weighs more than the ice.
 - B. The ice weighs more than the water.
 - C. The ice is less dense than the water.
 - D. The water is less dense than the ice.
8. Which of the following is an accurate depiction of how lightning works?



9. At what point on the graphic below is potential energy the highest?



NATURE OF SCIENCE

Use the following scenario to answer questions 10-13.

A student is conducting an experiment. She is testing the effectiveness of fertilizer A and fertilizer B. She has done research on both fertilizers and predicts that fertilizer A will be more effective than fertilizer B because fertilizer A contains more phosphorous.

She has 3 pots. In the first pot, she adds 5 seeds, fertilizer A, and 4 quarts of dirt. In the second pot, she adds 5 seeds, fertilizer B, and 4 quarts of dirt. In the third pot, she adds 5 seeds, no fertilizer, and 4 quarts of dirt. She uses the same amount of water every day to water the plants. All of the plants receive the same amount of sunlight. In two weeks, she measures the difference in growth among the three plants.

10. In this experiment, the student's prediction is called the:

- A. control
- B. constant
- C. independent variable
- D. hypothesis

11. In this experiment, the fertilizer is the:


- A. control
- B. constant
- C. independent variable
- D. dependent variable

12. In this experiment, the pot with no fertilizer is the:

- A. control
- B. constant
- C. independent variable
- D. hypothesis

13. In this experiment, the difference in growth is the:

- A. control
- B. constant
- C. independent variable
- D. dependent variable

Number	Answer	Explanation
1.	D	Earth makes a full orbit around the sun in 365 days—1 full calendar year. Earth rotates one full rotation on its axis every 24 hours—1 day.
2.	A	Aquifers are below Earth's crust, below the water table, and above the bedrock. The mantle and the core are very deep below Earth's crust.
3.	B	Hydro means water. The picture is of the water cycle; therefore, it is the hydrosphere.
4.	A	Animalia (or animals) do not make their own food. Instead, animals go through a process of cellular respiration, where they eat food. Answers B, C, and D all make their own food during photosynthesis.
5.	B	Metaphase is the stage where the chromosomes move the middle of the cell and prepare to be separated. An easy way to remember this is to think middle when thinking metaphase.
6.	A	Grasses go through photosynthesis; therefore, they are producers. They produce their own food and are at the bottom of the energy pyramid. Bunnies eat the grass; snakes eat the bunnies; and hawks eat the snakes.
7.	C	This is a density question. In this case, because the ice is floating in the water, the ice is less dense than the water.
8.	D	<p>Lightning occurs between opposite charges in the cloud and on the ground (cloud-to-ground lightning).</p> 
9.	A	Potential energy is at its highest when kinetic energy is at its lowest. When a motorcycle is traveling down a hill, the very top of the hill is when the highest potential energy occurs.
10.	D	A hypothesis is a prediction based on evidence. She conducted research on the fertilizers before making the prediction. Therefore, she made a hypothesis.
11.	C	The independent variable is the variable that is changed in the experiment. In this case, it is the fertilizer. Everything else remains the same.

Number	Answer	Explanation
12.	A	The control is what is kept the same throughout the experiment. In this case, the pot with no fertilizer is the control. Having a control is essential. It is difficult to see the difference in growth between fertilizers without having a pot with no fertilizer.
13.	D	The dependent variable is the thing that changes because of the experiment. In this case, the growth was affected by fertilizer A, fertilizer B, or no fertilizer.