

## Elementary Education: Content Knowledge (0014/5014)

<i>Test at a Glance</i>				
Test Name	Elementary Education: Content Knowledge			
Test Code	0014	5014		
Time	2 hours	2 hours		
Number of Questions	120	120		
Format	Multiple-choice questions		Multiple-choice questions	
Test Delivery	Paper delivered	Computer delivered		
	Content Categories		Approximate Number of Questions	
			Approximate Percentage of Examination	
	I.	Reading/Language Arts	30	25%
	II.	Mathematics	30	25%
	III.	Social Studies	30	25%
IV.	Science	30	25%	

### About This Test

The Elementary Education: Content Knowledge test is designed for prospective teachers of children in primary through upper elementary school grades. The 120 multiple-choice questions focus on four major subject areas: reading/language arts, mathematics, social studies, and science. Test questions are arranged in the test book by subject area. Each of the four content areas constitutes 25 percent of the test.

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

## Topics Covered

### I. READING/LANGUAGE ARTS

#### A. Foundations of Reading (50%)

1. Understands the foundations of literacy and reading development (e.g., language acquisition, support of second-language learners, concept of print)
2. Understands the role of phonological awareness (e.g., rhyming, segmenting) and phonics (e.g., decoding, letter-sound correspondence, syllabication) in literacy development
3. Understands the role of fluency (e.g., rate, accuracy) in literacy development
4. Understands the role of vocabulary (e.g., affixes, root words, context clues) in literacy development
5. Understands the role of comprehension (e.g., role of prior knowledge, literal and critical comprehension, metacognition) in literacy development
6. Understands the basic elements of fiction and nonfiction texts for children
7. Understands the basic elements of poetry (e.g., mood, rhythm) and drama (e.g., puppetry, story theater) for children
8. Understands the uses of figurative language (e.g., metaphor, simile, alliteration)
9. Understands how to use resource material (e.g., types of resources, graphic organizers) in reading and language arts

#### B. Language in Writing (33%)

1. Knows the components of written language (e.g., elements of grammar, usage, syntax)
2. Knows types (e.g., narrative, persuasive, journaling) and traits (e.g., tone, purpose, audience) of writing
3. Knows the stages of the writing process (e.g., draft, edit, publish)
4. Knows the stages of writing development (e.g., picture, scribble, letter for words)
5. Knows sentence types (e.g., declarative, imperative) and sentence structure (e.g., simple, compound, complex)
6. Knows structures (e.g., description, definition, examples) and organization (e.g., descriptive, comparison/contrast, persuasion) of writing

#### C. Communication Skills (Speaking, Listening, and Viewing) (17%)

1. Understands different aspects of speaking (e.g., purpose, audience, tone)
2. Understands different aspects of listening (e.g., following directions, responding to questions appropriately, focusing on the speaker)
3. Understands different aspects of viewing (e.g., interpreting images, evaluating media techniques, understanding the message)
4. Understands the role that speaking, listening, and viewing play in language acquisition for second-language learners

### II. MATHEMATICS

#### D. Mathematical Processes

1. Understands mathematical processes (e.g., representation, problem solving, making connections)

#### E. Number Sense and Numeration (40%)

1. Understands prenumeration concepts (e.g., informal counting, meaning of number, patterns)
2. Understands basic number systems (e.g., whole numbers, integers, fractions, decimals)
3. Understands basic four operations (e.g., addition, subtraction, multiplication, and division) and their properties (e.g., commutativity, order of operations)
4. Understands basic concepts of number theory (e.g., factors, multiples, prime and composite)
5. Understands how to solve problems (e.g., modeling, estimation, algorithms) and recognize the reasonableness of results
6. Understands how to make, describe, and explore numerical patterns and engage in mathematical investigations

**F. Algebraic Concepts (25%)**

1. Understands basic algebraic methods and representations
2. Understands the associative, commutative, and distributive properties
3. Understands additive and multiplicative inverses
4. Understands the special properties of zero and one
5. Understands equalities and inequalities
6. Understands the appropriate application of formulas

**G. Informal Geometry and Measurement (20%)**

1. Understands properties of figures and relationships in two- and three-dimensional objects
2. Understands transformations (e.g., slides, flips, and turns), geometric models, and nets
3. Understands nonstandard, customary, and metric units of measurement (e.g., length, time, temperature)

**H. Data Organization and Interpretation (15%)**

1. Understands visual displays of quantitative information (e.g., bar graphs, pie charts, line graphs)
2. Understands simple probability and intuitive concepts of chance (e.g., flipping a coin, spinning a spinner, rolling a number cube)
3. Understands fundamental counting techniques (e.g., permutations, combinations, tree diagrams)
4. Understands basic descriptive statistics (e.g., mean, median, and mode)

**III. SOCIAL STUDIES**

**I. Geography, Anthropology, Sociology (30%)**

1. Knows world and regional geography (e.g., spatial terms, places, and regions)
2. Understands the interaction of physical and human systems (e.g., how humans change the environment, how the environment changes humans, importance of natural and human resources)
3. Knows the uses of geography (e.g., apply geography to interpret past, to interpret present, to plan for future)
4. Knows how people of different cultural backgrounds interact with their environment, self, family, neighborhoods, and communities

**J. World History (10%)**

1. Knows the major contributions of classical civilizations (e.g., Egypt, Greece, Rome)
2. Understands twentieth-century developments and transformations in World history
3. Understands the role of cross-cultural comparisons in World history instruction

**K. United States History (30%)**

1. Knows European exploration and colonization in United States history and growth and expansion of the United States
2. Knows about the American Revolution and the founding of the nation in United States History
3. Knows the major events and developments in United States history from founding to present (e.g., westward expansion, industrialization, Great Depression)
4. Knows about twentieth-century developments and transformations in the United States (e.g., assembly line, space age)
5. Understands connections between causes and effects of events

**L. Government, Citizenship, and Democracy (10%)**

1. Understands the nature, purpose, and forms (e.g., federal, state, local) of government
2. Knows key documents and speeches in the history of the United States (e.g., United States Constitution, Declaration of Independence, Gettysburg Address)
3. Knows the rights and responsibilities of citizenship in a democracy

**M. Economics (10%)**

1. Knows key terms and basic concepts of economics (e.g., supply and demand, scarcity and choice, money and resources)
2. Understands how economics affects population, resources, and technology
3. Understands the government's role in economics and impact of economics on government

**N. Social Studies as Inquiry and Social Studies Processes (10%)**

1. Understands social studies as inquiry (e.g., questioning, gathering data, drawing reasonable conclusions)
2. Understands how to use resource and research material in social studies
3. Understands process skills in social studies (e.g., interpreting different types of information; evaluating relationships; drawing conclusions using tools of the field)

**IV. SCIENCE**

**O. Earth Science (30%)**

1. Understands the structure of the Earth system (e.g., structure and properties of the solid Earth, the hydrosphere, the atmosphere)
2. Understands processes of the Earth system (e.g., earth processes of the solid Earth, the hydrosphere, the atmosphere)
3. Understands Earth history (e.g., origin of Earth, paleontology, the rock record)
4. Understands Earth and the universe (e.g., stars and galaxies; the solar system and planets; Earth, Sun, and Moon relationships)
5. Understands Earth patterns, cycles, and change

**P. Life Science (30%)**

1. Understands the structure and function of living systems (e.g., living characteristics and cells, tissues and organs, life processes)
2. Understands reproduction and heredity (e.g., growth and development, patterns of inheritance of traits, molecular basis of heredity)
3. Understands change over time in living things (e.g., life cycles, mutations, adaptations and natural selection)
4. Understands regulation and behavior (e.g., life cycles, responses to external stimuli, controlling the internal environment)
5. Understands unity and diversity of life, adaptation, and classification
6. Understands the interdependence of organisms (e.g., ecosystems, populations, communities)

**Q. Physical Science (30%)**

1. Understands the physical and chemical properties and structure of matter (e.g., changes of states, mixtures and solutions, atoms and elements)
2. Understands forces and motions (e.g., types of motion, laws of motion, forces and equilibrium)
3. Understands energy (e.g., forms of energy, transfer and conservation of energy, simple machines)
4. Understands interactions of energy and matter (e.g., electricity, magnetism, sound)

**R. Science in Personal and Social Perspectives (5%)**

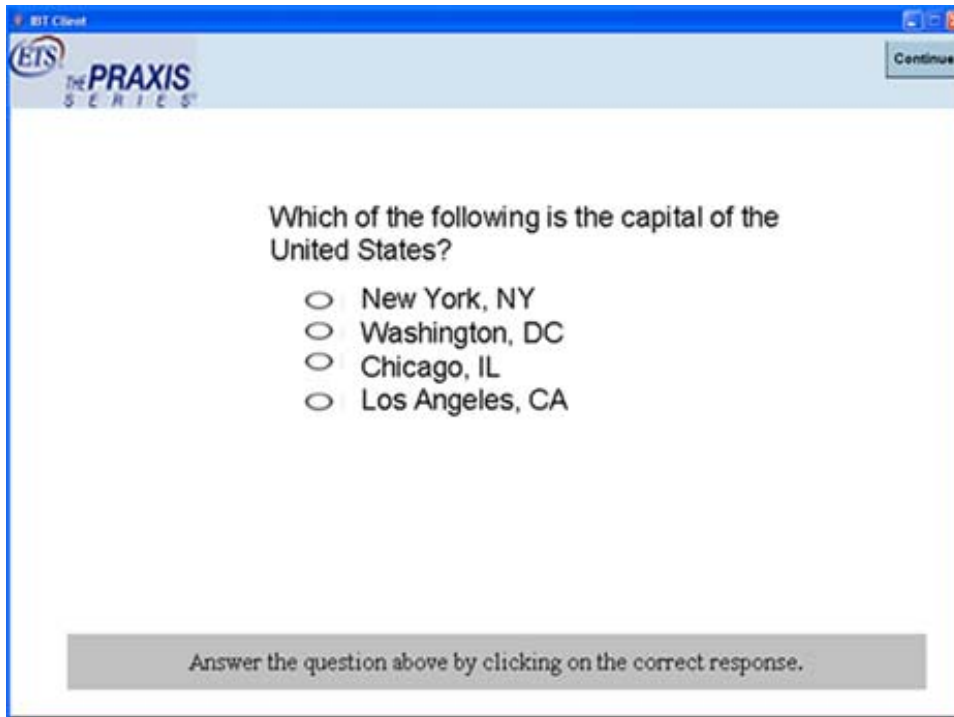
1. Knows about personal health (e.g., nutrition, communicable diseases, substance abuse)
2. Understands science as a human endeavor, process, and career

**S. Science as Inquiry and Science Processes (5%)**

1. Understands science as inquiry (e.g., questioning, gathering data, drawing reasonable conclusions)
2. Understands how to use resource and research material in science
3. Understands the unifying processes of science (e.g., systems, order, and organization)

This test is available via paper delivery or computer delivery; other than the delivery method, there is no difference between the tests. The test content is the same for both test codes.

The following sample question provides a preview of the actual screen used in the computer delivered test.



Here is the same sample question presented as it would appear on a paper delivered test:

- Which of the following is the capital of the United States?
- (A) New York, NY
  - (B) Washington, DC
  - (C) Chicago, IL
  - (D) Los Angeles, CA

For the purposes of the test at a glance, the sample questions will be provided as they would appear in a paper delivered test.

## Sample Test Questions

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

**Directions:** Each of the questions or statements below is followed by four suggested answers or completions. Select the one that is best in each case.

### I. Language Arts

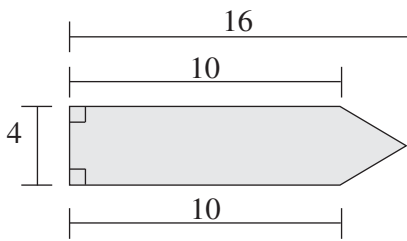
Questions 1–2 refer to the following poem:

Leave me, O love which reaches but to dust;  
And thou, my mind, aspire to higher things;  
Grow rich in that which never taketh rust,  
Whatever fades but fading pleasure brings.

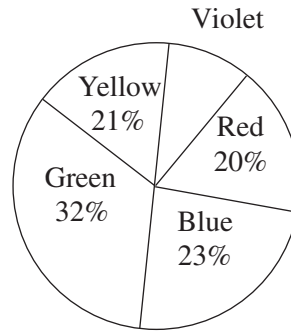
- In line 1 “dust” serves as a metaphor for
  - ignorance
  - death
  - loneliness
  - confusion
- The lines above comment on the speaker’s desire to
  - seek out immediate pleasures
  - enrich himself
  - reject that which is transitory
  - revive the past
- According to research, which of the following is the single most important home-based activity for preschool children in building the knowledge required for children’s eventual success in reading?
  - Children’s memorizing nursery rhymes
  - Families’ talking about school
  - Parents’ reading aloud to children
  - Parents’ teaching the alphabet
- Entries in outlines are generally arranged according to which of the following relationships of ideas?
  - Literal and inferential
  - Concrete and abstract
  - Linear and recursive
  - Main and subordinate
- Manuel is the tallest of the two boys.  
Which of the following statements about the above sentence is true?
  - The sentence is written correctly.
  - The subject and verb do not agree.
  - The word “boys” should be possessive.
  - “Tallest” modifies Manuel incorrectly.
- All of the following statements are descriptive of listening behavior EXCEPT:
  - Careful listening can lead to anticipation of a speaker’s actions.
  - People learn to listen selectively and can even shut out what is undesirable.
  - Listening comprises at least one-half of all communication.
  - The ability to be a good listener comes naturally and without training.

**II. Mathematics**

7. Riding on a school bus are 20 students in 9th grade, 10 in 10th grade, 9 in 11th grade, and 7 in 12th grade. Approximately what percent of the students on the bus are in 9th grade?
- (A) 23%  
 (B) 43%  
 (C) 46%  
 (D) 76%
8. Which of the following is equal to  $8^4$ ?
- (A) 4,032  
 (B) 4,064  
 (C) 4,096  
 (D) 4,128
9. In the formula  $x = 10y$ , if  $y$  is positive and the value of  $y$  is multiplied by 2, then the value of  $x$  is
- (A) divided by 10  
 (B) multiplied by 10  
 (C) halved  
 (D) doubled



10. The area of the shaded region above is
- (A) 30  
 (B) 52  
 (C) 64  
 (D) 116

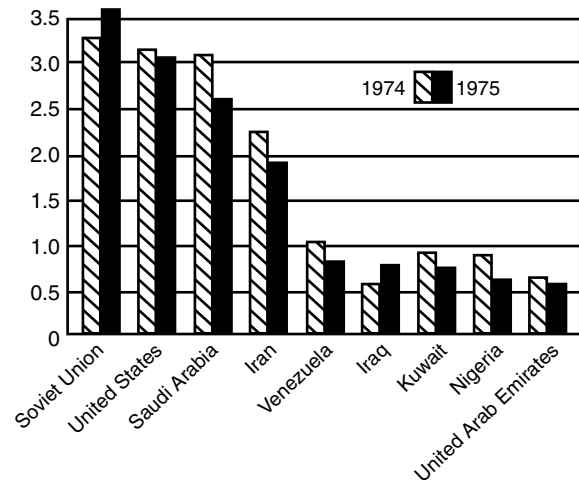


11. The circle graph above represents the percent of colored gems in a collection. If the collection has a total of 50 gems, how many gems are violet?
- (A) 2  
 (B) 3  
 (C) 4  
 (D) 5

**III. Social Studies**

12. Mount Rainier is located in which of the following mountain ranges?
- (A) The Cascades  
 (B) The Rockies  
 (C) The Appalachians  
 (D) The Alps
13. Which of the following is believed to have occurred during the last Ice Age as a result of a land bridge created between what are now Siberia and Alaska?
- (A) The invention of new technologies for sheltering humans against sustained cold  
 (B) The blockage of important trade routes  
 (C) The establishment of human settlements in North America  
 (D) Widespread famine

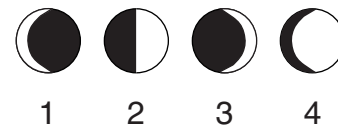
14. Since the end of the United States Civil War in 1865, all of the following have been major objectives of groups seeking civil rights for Black people except
- (A) passage of affirmative action legislation
  - (B) desegregation of public educational facilities
  - (C) creation of a third party in national politics
  - (D) passage of antilynching laws
15. What percent of the seats in the United States House of Representatives are up for election every two years?
- (A) 33%
  - (B) 50%
  - (C) 66%
  - (D) 100%
16. Historically India's society has been organized into hierarchical groups known as
- (A) tribes
  - (B) castes
  - (C) clans
  - (D) denominations



17. According to the graph above, how many of the countries shown produced more crude oil in 1975 than 1974?
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4

**IV. Science**

18. Which of the following geological processes adds new rock to the surface of the Earth?
- (A) Volcanic activity
  - (B) Glacial activity
  - (C) Soil erosion
  - (D) Weathering



19. Which of the diagrams above best depicts the Moon as viewed from Earth at the first quarter of the lunar cycle?
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4

20. Which of the following is NOT a way in which mammals keep themselves warm in winter?
- (A) Shivering
  - (B) Perspiring
  - (C) Fluffing out coat hair
  - (D) Contracting certain blood vessels
21. Which of the following would be observed in a vacuum if a feather and two stones of different weights were dropped simultaneously from a height of ten feet?
- (A) Both stones would hit the ground at the same time, but before the feather.
  - (B) The heavier stone would hit the ground first.
  - (C) The lighter stone would hit the ground first.
  - (D) All three objects would hit the ground at the same time.
22. Which of the following laboratory instruments would be most appropriate to use in determining the volume of a large block of wood of unknown density?
- (A) A metric ruler
  - (B) A triple-beam balance
  - (C) A 200 mL volumetric flask
  - (D) A micrometer
23. Which of the following best describes a scientific hypothesis?
- (A) It ensures that successful results will be obtained from an experiment.
  - (B) It must be accepted as true by the scientific community.
  - (C) It is a testable proposal that may lead to experimentation.
  - (D) It must be formulated by a renowned scientist.
24. Which of the following is the broadest category in the biological taxonomy?
- (A) Kingdom
  - (B) Order
  - (C) Genus
  - (D) Species

## Answers

**1.** The correct answer is B. In literature the word “dust” is often associated with death because life forms decay into soil after death. A metaphor is figurative language that connects one image or idea with another.

**2.** The correct answer is C. The word “transitory” refers to change, and the speaker mentions a desire to reject things that turn to dust, acquire dust, and start to fade. These are all types of change.

**3.** The correct answer is C. Research shows that parents’ reading aloud to children during the preschool years is the most influential home literacy activity and is especially beneficial when children are active participants.

**4.** The correct answer is D. The entries in outlines generally present a main idea followed by a hierarchical arrangement of subordinate ideas.

**5.** The correct answer is D. “Tallest” is in the superlative degree which is used when comparing more than two things. “Taller” is the correct word to use since it is in the comparative degree.

**6.** The correct answer is D. Authorities agree that effective listening is not a natural ability but requires study and practice.

**7.** The correct answer is B. Percent refers to “how many out of one hundred” or, in decimal form, “how many hundredths.” To find a percent, divide the group (20) by the total (46) and round the decimal to the hundredths place (0.43). This is 43 hundredths or 43/100 or 43%.

**8.** The correct answer is C. The exponent 4 tells how many times to multiply the base 8 by itself. In this case,  $8^4 = 8 \times 8 \times 8 \times 8 = 4,096$ .

**9.** The correct answer is D. This can be shown algebraically as follows. Given that  $10y = x$ , then 10 times  $2y$  equals  $20y$ , which is 2 times  $x$ . Thus, when the value of  $y$  is doubled, the value of  $x$  is doubled.

**10.** The correct answer is B. The rectangle has length 10 and width 4; so its area is 40. The triangle can be thought of as having a base 4 and an altitude of 6. Its area is  $\frac{1}{2} \times 4 \times 6$ , or 12. The combined area is therefore  $40 + 12$ , or 52.

**11.** The correct answer is A. A circle graph of percents represents 100% of a group. So, to find the percent of violet gems, subtract the total percent of the other colors, 96%, from 100% to get 4%. Since 4% or 4/100 of the gems are violet, 2 out of the total of 50 gems are violet. This can be determined by multiplying 50 by 4% or 0.04, or by setting up equivalent fractions:  $4/100 = 2/50$ .

**12.** The correct answer is A. Mount Rainier is located in the state of Washington. The greatest single-peak glacial system in the United States radiates from this dormant volcano in the Cascade Mountains.

**13.** The correct answer is C. During the Ice Age, the level of the water in the Pacific Ocean lowered, exposing a land bridge across the Bering Strait. The cold northern climate encouraged many people to migrate throughout the continent in search of better living conditions.

**14.** The correct answer is C. The creation of a third party in national politics would be a political action, not one of civil rights.

**15.** The correct answer is D. Article 1 Section 2 of the Constitution of the United States says, “The House of Representatives shall be composed of Members chosen every second Year by the People... .” All members of the House are elected at the same time every two years.

**16.** The correct answer is B. In the fifteenth century AD, explorers from Portugal encountered the social system of India and called these groups castes. As time went on, the four basic castes gradually grew more complex, with hundreds of subdivisions.

**17.** The correct answer is B. Since the numbers on the left side of the graph increase from bottom to top, it is a matter of determining how many shaded bars are higher than their corresponding striped bars.

**18.** The correct answer is A. Volcanic activity is the only process by which material from inside the Earth is brought to the surface. The other processes are means of wearing down Earth’s surface.

**19.** The correct answer is B. At the first lunar quarter the sun, Earth, and moon form a right triangle, with Earth at the right angle, so that the half of the moon facing Earth appears half lighted and half dark.

**20.** The correct answer is B. Perspiring is an adaptation that allows mammals to lose heat. When the body temperature rises, sweat is produced. As the water in the sweat evaporates, the skin is cooled, not warmed.

**21.** The correct answer is D. In a vacuum, the only external force acting on each of the objects would be the gravitational force of the Earth. This gravitational force is equal to  $M \times g$ , where  $M$  is the object's mass and  $g$  is the constant acceleration of gravity (9.8 meters per second squared). According to Newton's second law, the acceleration,  $a$ , of an object times its mass is equal to the external force acting on it. For this situation, Newton's second law gives  $M \times a = M \times g$ , or  $a = g$ . Thus, in a vacuum all objects fall freely with the same constant acceleration  $g$  regardless of their mass.

**22.** The correct answer is A. To find the volume of a large rectangular block of wood, first use the metric ruler to find the length, width, and height of the block. Then use the formula for the volume of a rectangular solid—length  $\times$  width  $\times$  height— to determine the volume.

**23.** The correct answer is C. A hypothesis is a best guess or a possible explanation of a scientific problem. Scientific experimentation can either support or fail to support the hypothesis.

**24.** The correct answer is A. When putting living things into a biological classification scheme, the broadest category is kingdom, followed by phylum, class, order, family, genus, and species.



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