

Preparation Manual

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Preparation Manual

Section 3: Overview and Exam Framework Core Subjects EC–6 (391)

Exam Overview

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| Exam Name | Core Subjects EC–6 (391) |
| Exam Code | 391 |
| Time | 5 hours English Language Arts and Reading: 1 hour and 10 minutes Mathematics: 1 hour and 10 minutes Social Studies: 50 minutes Science: 55 minutes Fine Arts, Health and Physical Education: 35 minutes |
| Number of Questions | 210 total selected-response questions English Language Arts and Reading: 45 selected-response questions Mathematics: 40 selected-response questions Social Studies: 40 selected-response questions Science: 45 selected-response questions Fine Arts, Health and Physical Education: 40 selected-response questions |
| Format | Computer-administered test (CAT) |

The TExES Core Subjects EC–6 (391) exam is designed to assess whether an examinee has the requisite knowledge and skills that an entry-level educator in this field in Texas public schools must possess. The 210 selected-response questions are based on the Core Subjects EC–6 exam framework and range from grades EC–6. The exam may contain questions that do not count toward the score. Your final scaled score will be based only on scored questions.

The exam is structured with five Subject Exams: English Language Arts and Reading; Mathematics; Social Studies; Science; and Fine Arts, Health and Physical Education.

If, upon completion of an entire Core Subjects EC–6 (391) exam, you do not pass one or more of the Subject Exams, you are eligible to retake a single Subject Exam if you passed all of the other Subject Exams, or the overall exam if you did not pass two or more Subject Exams. Each testing session counts as an attempt for the Core Subjects EC–6 (391) exam, whether the overall exam or an individual Subject Exam (i.e., 901–905) is attempted.

The timing for the Core Subjects EC–6 (391) exam is by subject exam, rather than the total exam.

The Standards

English Language Arts and Reading EC–6 Standard I

Oral Language: Teachers of young students understand the importance of oral language, know the developmental processes of oral language and provide a variety of instructional opportunities for young students to develop listening and speaking skills.

**English Language Arts
and Reading EC–6
Standard II**

Phonological and Phonemic Awareness: Teachers of young students understand the components of phonological and phonemic awareness and utilize a variety of approaches to help young students develop this awareness and its relationship to written language.

**English Language Arts
and Reading EC–6
Standard III**

Alphabetic Principle: Teachers of young students understand the importance of the alphabetic principle to reading English, know the elements of the alphabetic principle and provide instruction that helps students understand that printed words consist of graphic representations that relate to the sounds of spoken language in conventional and intentional ways.

**English Language Arts
and Reading EC–6
Standard IV**

Literacy Development and Practice: Teachers of young students understand that literacy develops over time and progresses from emergent to proficient stages. Teachers use a variety of contexts to support the development of young students' literacy.

**English Language Arts
and Reading EC–6
Standard V**

Word Analysis and Decoding: Teachers understand the importance of word analysis and decoding to reading and provide many opportunities for students to improve word analysis and decoding abilities.

**English Language Arts
and Reading EC–6
Standard VI**

Reading Fluency: Teachers understand the importance of fluency to reading comprehension and provide many opportunities for students to improve reading fluency.

**English Language Arts
and Reading EC–6
Standard VII**

Reading Comprehension: Teachers understand the importance of reading for understanding, know the components of comprehension and teach young students strategies for improving comprehension.

**English Language Arts
and Reading EC–6
Standard VIII**

Development of Written Communication: Teachers understand that writing to communicate is a developmental process and provide instruction that helps young students develop competence in written communication.

**English Language Arts
and Reading EC–6
Standard IX**

Writing Conventions: Teachers understand how young students use writing conventions and how to help students develop those conventions.

**English Language Arts
and Reading EC–6
Standard X**

Assessment and Instruction of Developing Literacy: Teachers understand the basic principles of assessment and use a variety of literacy assessment practices to plan and implement literacy instruction for young students.

**English Language Arts
and Reading EC–6
Standard XI**

Research and Inquiry Skills: Teachers understand the importance of study and inquiry skills as tools for learning and promote students' development in applying study and inquiry skills.

**English Language Arts
and Reading EC–6
Standard XII**

Viewing and Representing: Teachers understand how to interpret, analyze, evaluate and produce.

**Mathematics
Standard I**

Number Concepts: The mathematics teacher understands and uses numbers, number systems and their structure, operations and algorithms, quantitative reasoning and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

**Mathematics
Standard II**

Patterns and Algebra: The mathematics teacher understands and uses patterns, relations, functions, algebraic reasoning, analysis and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

**Mathematics
Standard III**

Geometry and Measurement: The mathematics teacher understands and uses geometry, spatial reasoning, measurement concepts and principles and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

**Mathematics
Standard IV**

Probability and Statistics: The mathematics teacher understands and uses probability and statistics, their applications and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

**Mathematics
Standard V**

Mathematical Processes: The mathematics teacher understands and uses mathematical processes to reason mathematically, to solve mathematical problems, to make mathematical connections within and outside of mathematics and to communicate mathematically.

**Mathematics
Standard VI**

Mathematical Perspectives: The mathematics teacher understands the historical development of mathematical ideas, the interrelationship between society and mathematics, the structure of mathematics and the evolving nature of mathematics and mathematical knowledge.

**Mathematics
Standard VII**

Mathematical Learning and Instruction: The mathematics teacher understands how children learn and develop mathematical skills, procedures and concepts; knows typical errors students make; and uses this knowledge to plan, organize and implement instruction; to meet curriculum goals; and to teach all students to understand and use mathematics.

**Mathematics
Standard VIII**

Mathematical Assessment: The mathematics teacher understands assessment and uses a variety of formal and informal assessment techniques appropriate to the learner on an ongoing basis to monitor and guide instruction and to evaluate and report student progress.

**Mathematics
Standard IX**

Professional Development: The mathematics teacher understands mathematics teaching as a profession, knows the value and rewards of being a reflective practitioner and realizes the importance of making a lifelong commitment to professional growth and development.

**Social Studies
Standard I**

The social studies teacher has a comprehensive knowledge of the social sciences and recognizes the value of the social sciences.

**Social Studies
Standard II**

The social studies teacher effectively integrates the various social science disciplines.

**Social Studies
Standard III**

The social studies teacher uses knowledge and skills of social studies, as defined by the Texas Essential Knowledge and Skills (TEKS), to plan and implement effective curriculum, instruction, assessment and evaluation.

**Social Studies
Standard IV**

History: The social studies teacher applies knowledge of significant historical events and developments, as well as of multiple historical interpretations and ideas, in order to facilitate student understanding of relationships between the past, the present and the future.

**Social Studies
Standard V**

Geography: The social studies teacher applies knowledge of people, places and environments to facilitate students' understanding of geographic relationships in Texas, the United States and the world.

**Social Studies
Standard VI**

Economics: The social studies teacher knows how people organize economic systems to produce, distribute and consume goods and services and uses this knowledge to enable students to understand economic systems and make informed economic decisions.

**Social Studies
Standard VII**

Government: The social studies teacher knows how governments and structures of power function, provide order and allocate resources and uses this knowledge to facilitate student understanding of how individuals and groups achieve their goals through political systems.

**Social Studies
Standard VIII**

Citizenship: The social studies teacher understands citizenship in the United States and other societies and uses this knowledge to prepare students to participate in our society through an understanding of democratic principles and citizenship practices.

**Social Studies
Standard IX**

Culture: The social studies teacher understands cultures and how they develop and adapt and uses this knowledge to enable students to appreciate and respect cultural diversity in Texas, the United States and the world.

**Social Studies
Standard X**

Science, Technology and Society: The social studies teacher understands developments in science and technology and uses this knowledge to facilitate student understanding of the social and environmental consequences of scientific discovery and technological innovation.

**Science
Standard I**

The science teacher manages classroom, field and laboratory activities to ensure the safety of all students and the ethical care and treatment of organisms and specimens.

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| Science Standard II | The science teacher understands the correct use of tools, materials, equipment and technologies. |
| Science Standard III | The science teacher understands the process of scientific inquiry and its role in science instruction. |
| Science Standard IV | The science teacher has theoretical and practical knowledge about teaching science and about how students learn science. |
| Science Standard V | The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning. |
| Science Standard VI | The science teacher understands the history and nature of science. |
| Science Standard VII | The science teacher understands how science affects the daily lives of students and how science interacts with and influences personal and societal decisions. |
| Science Standard VIII | The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in physical science. |
| Science Standard IX | The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in life science. |
| Science Standard X | The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in Earth and Space science. |
| Science Standard XI | The science teacher knows unifying concepts and processes that are common to all sciences. |
| Art Standard I | The art teacher understands how ideas for creating art are developed and organized from the perception of self, others and natural and human-made environments. |

**Art
Standard II**

The art teacher understands the skills and techniques needed for personal and creative expression through the creation of original works of art in a wide variety of media and helps students develop those skills and techniques.

**Art
Standard III**

The art teacher understands and promotes students' appreciation of art histories and diverse cultures.

**Art
Standard IV**

The art teacher understands and conveys the skills necessary for analyzing, interpreting and evaluating works of art and is able to help students make informed judgments about personal artworks and those of others.

**Art
Standard V**

The art teacher understands how children develop cognitively and artistically and knows how to implement effective, age-appropriate art instruction and assessment.

**Music
Standard I**

The music teacher has a comprehensive visual and aural knowledge of musical perception and performance.

**Music
Standard II**

The music teacher sings and plays a musical instrument.

**Music
Standard III**

The music teacher has a comprehensive knowledge of music notation.

**Music
Standard IV**

The music teacher creates and arranges music.

**Music
Standard V**

The music teacher has a comprehensive knowledge of music history and the relationship of music to history, society and culture.

**Music
Standard VI**

The music teacher applies a comprehensive knowledge of music to evaluate musical compositions, performances and experiences.

**Music
Standard VII**

The music teacher understands how to plan and implement effective music instruction and provides students with learning experiences that enhance their musical knowledge, skills and appreciation.

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| Music Standard VIII | The music teacher understands and applies appropriate management and discipline strategies for the music class. |
| Music Standard IX | The music teacher understands student assessment and uses assessment results to design instruction and promote student progress. |
| Music Standard X | The music teacher understands professional responsibilities and interactions relevant to music instruction and the school music program. |
| Health Standard I | The health teacher applies knowledge of both the relationship between health and behavior and the factors influencing health and health behavior. |
| Health Standard II | The health teacher communicates concepts and purposes of health education. |
| Health Standard III | The health teacher plans and implements effective school health instruction and integrates health instruction with other content areas. |
| Health Standard IV | The health teacher evaluates the effects of school health instruction. |
| Physical Education Standard I | The physical education teacher demonstrates competency in a variety of movement skills and helps students develop these skills. |
| Physical Education Standard II | The physical education teacher understands principles and benefits of a healthy, physically active lifestyle and motivates students to participate in activities that promote this lifestyle. |
| Physical Education Standard III | The physical education teacher uses knowledge of individual and group motivation and behavior to create and manage a safe, productive learning environment and promotes students' self-management, self-motivation and social skills through participation in physical activities. |
| Physical Education Standard IV | The physical education teacher uses knowledge of how students learn and develop to provide opportunities that support students' physical, cognitive, social and emotional development. |

**Physical Education
Standard V**

The physical education teacher provides equitable and appropriate instruction for all students in a diverse society.

**Physical Education
Standard VI**

The physical education teacher uses effective, developmentally appropriate instructional strategies and communication techniques to prepare physically educated individuals.

**Physical Education
Standard VII**

The physical education teacher understands and uses formal and informal assessment to promote students' physical, cognitive, social and emotional development in physical education contexts.

**Physical Education
Standard VIII**

The physical education teacher is a reflective practitioner who evaluates the effects of his/her actions on others (e.g., students, parents/caregivers, other professionals in the learning environment) and seeks opportunities to grow professionally.

**Physical Education
Standard IX**

The physical education teacher collaborates with colleagues, parents/caregivers and community agencies to support students' growth and well-being.

**Physical Education
Standard X**

The physical education teacher understands the legal issues and responsibilities of physical education teachers in relation to supervision, planning and instruction, matching participants, safety, first aid and risk management.

**Theatre
Standard I**

The theatre teacher knows how to plan and implement effective theatre instruction and assessment and provide students with learning experiences that enhance their knowledge, skills and appreciation in theatre.

**Theatre
Standard II**

The theatre teacher understands and applies skills for creating, utilizing and/or performing dramatic material.

**Theatre
Standard III**

The theatre teacher understands and applies skills for producing and directing theatrical productions.

**Theatre
Standard IV**

The theatre teacher understands and applies knowledge of design and technical theater.

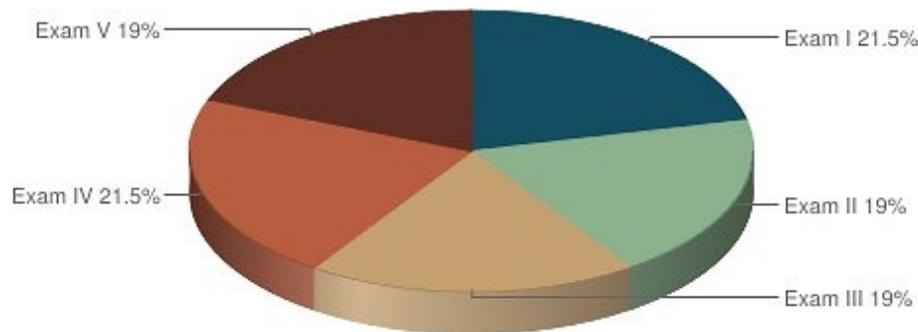
**Theatre
Standard V**

The theatre teacher understands and applies knowledge of theatre from different cultures and historical periods.

Theatre Standard VI

The theatre teacher understands and applies skills for responding to, analyzing and evaluating theatre and understands the interrelationship between theatre and other disciplines.

Subject Exams and Competencies



The content covered by this exam is organized into broad areas of content called **domains**. Each domain covers one or more of the educator standards for this field. Within each domain, the content is further defined by a set of **competencies**. Each competency is composed of two major parts:

- The **competency statement**, which broadly defines what an entry-level educator in this field in Texas public schools should know and be able to do.
- The **descriptive statements**, which describe in greater detail the knowledge and skills eligible for testing.

Subject Exam I—English Language Arts and Reading (901)

Competency 001—(Oral Language): The teacher understands the importance of oral language, knows the developmental processes of oral language, and provides students with varied opportunities to develop listening and speaking skills.

The beginning teacher:

- Knows and teaches basic linguistic concepts and the developmental stages in the acquisition of oral language—including phonology, semantics, syntax (subject-verb agreement and subject-verb inversion), and pragmatics—as appropriate for students in grades 4–6 and recognizes that individual variations occur within and across languages.
- Plans and implements systematic oral language instruction based on informal and formal assessment of all students, including English learners; fosters oral language development; and addresses students' individual needs, strengths, and interests in grades 4–6.
- Designs a variety of one-on-one and group activities (e.g., having discussions, questioning, sharing information) to build on students' current oral language skills.
- Selects and uses instructional materials and strategies for students in grades 4–6 that respond to students' individual needs, strengths, and interests; reflect cultural diversity; and build on students' cultural, linguistic, and home backgrounds to enhance their oral language development.
- Provides instruction that interrelates oral and written language to promote students' reading and writing proficiencies.

- F. Selects and uses instructional strategies, materials, activities, and models to teach students in grades 4–6 skills for speaking to various audiences for various purposes and for adapting spoken language for various audiences, purposes, and occasions.
- G. Selects and uses instructional strategies, materials, activities, and models to teach students listening skills for various purposes (e.g., critical listening to evaluate a speaker's message, listening to enjoy and appreciate spoken language) and provides students with opportunities to engage in active, purposeful listening in a variety of contexts.
- H. Selects and uses instructional strategies, materials, activities, and models to teach students in grades 4–6 to evaluate the content and effectiveness of their own spoken messages and the messages of others.

Competency 002—(Word Analysis and Identification Skills): The teacher understands the importance of word analysis and identification skills for reading comprehension and provides many opportunities for students to practice and improve these skills.

The beginning teacher:

- A. Uses a variety of instructional approaches and materials to promote students' phonetic, graphophonemic, and morphophonemic knowledge as outlined in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- B. Understands the importance of word recognition skills (e.g., structural analysis, identifying and reading high-frequency words from a research-based list, contextual analysis) for reading comprehension and knows a variety of strategies for helping students in grades 4–6 develop and apply word analysis skills, including identifying, categorizing, and using common synonyms, antonyms, homographs, homophones, and analogies.
- C. Selects and uses instructional strategies, materials, activities, and models to teach students in grades 4–6 to read high-frequency words, to promote the students' ability to decode increasingly complex words, and to enhance word identification skills of students who read at varying levels.
- D. Knows and teaches strategies for decoding increasingly complex words, including advanced vowel-sound combinations, structural or morphological elements (e.g., prefixes, suffixes, roots, base words), and syllable types and syllable division patterns, and for using syntax and semantics to support word identification and confirm word meaning for students in grades 4–6.
- E. Understands the value of using dictionaries, glossaries, and other sources to determine the meanings, usage, pronunciations, correct spelling, and derivations of unfamiliar words and teaches students in grades 4–6 how to use these sources.
- F. Understands how to foster collaboration with families and with other professionals to promote all students' skills in word analysis and identification.

Competency 003—(Reading Fluency): The teacher understands the importance of fluency for reading comprehension and provides many opportunities for students to improve their reading fluency.

The beginning teacher:

- A. Knows the relationship between reading fluency and comprehension for students in grades 4–6.
- B. Understands that fluency involves rate, accuracy, prosody, and intonation and knows the norms for reading fluency that have been established by the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- C. Understands the connection of word identification skills and reading fluency to reading comprehension for students in grades 4–6.

- D. Understands differences in students' development of word identification skills and reading fluency and knows instructional practices for meeting students' individual needs in those areas for students in grades 4–6.
- E. Selects and uses instructional strategies, materials, and activities to develop and improve fluency for students in grades 4–6.
- F. Knows how to teach students in grades 4–6 strategies for reading books independently, including the use of technology to support grade-level content.
- G. Provides students with opportunities to engage in silent reading and extended reading of a wide range of materials, including informational texts and texts from various literary genres, as outlined in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- H. Uses strategies to encourage reading for pleasure and lifelong learning.
- I. Recognizes the interrelationship between reading fluency and the other components of reading for students in grades 4–6.
- J. Understands how to foster collaboration with families and with other professionals to promote all students' reading fluency in grades 4–6.

Competency 004—(Reading Comprehension and Applications): The teacher understands the importance of reading for understanding, knows the components and processes of reading comprehension, and teaches students strategies for improving their comprehension, including using a variety of texts and contexts.

The beginning teacher:

- A. Understands factors affecting reading comprehension (e.g., word analysis skills, prior knowledge, language background/experience, previous reading experiences, fluency, vocabulary development, ability to monitor understanding, characteristics of specific texts) for students in grades 4–6.
- B. Understands levels of reading comprehension and knows how to model and teach skills for literal comprehension (e.g., identifying stated main idea, recalling details, identifying point of view), inferential comprehension (e.g., inferring themes, making predictions), and evaluative comprehension (e.g., analyzing character development, detecting faulty reasoning) for students in grades 4–6.
- C. Provides instruction in comprehension skills that support the transition of students in grades 4–6 from "learning to read" to "reading to learn" (e.g., setting a purpose for reading; applying knowledge of text structures; using text features such as pronunciation guides, introductions, and sidebars) to become self-directed, critical readers.
- D. Uses various instructional strategies to enhance reading comprehension (e.g., linking text content to students' lives and prior knowledge, connecting related ideas across different texts, comparing different versions of the same story, explaining the meaning of common idioms and adages, engaging students in guided and independent reading, guiding students to generate questions and apply knowledge of text topics) for students in grades 4–6.
- E. Knows and teaches strategies that facilitate comprehension of different types of texts (e.g., literary, informational, argumentative) before, during, and after reading (e.g., previewing, making predictions, questioning, self-monitoring, rereading, mapping, using reading journals, discussing texts) for students in grades 4–6.
- F. Knows and teaches strategies that facilitate making connections between and across multiple texts (e.g., summarizing and paraphrasing, locating and distinguishing between facts and opinions, determining whether a text supports or opposes an issue) for students in grades 4–6.
- G. Understands metacognitive skills, including self-evaluation and self-monitoring skills, and teaches students to use those skills to enhance their reading comprehension in grades 4–6.

- H. Knows how to provide students in grades 4–6 with systematic, explicit instruction and reinforcing activities to promote the use of strategies to improve their reading comprehension (e.g., previewing, self-monitoring, visualizing, summarizing).
- I. Selects and uses instructional strategies, materials, and activities to guide students' understanding of their own culture and the cultures of others through reading in grades 4–6.
- J. Understands and teaches the features of various literary genres, including folktales, fables, legends, myths, realistic fiction, historical fiction, tall tales, drama, and poetry, and promotes the development of literary response and analysis skills by providing multiple opportunities for students in grades 4–6 to listen to and respond to literature and to interact with others about literature.
- K. Knows the difference between guided and independent practice in reading and provides students in grades 4–6 with frequent opportunities for both.
- L. Understands how to foster collaboration with families and with other professionals to promote all students' reading comprehension in grades 4–6.

Competency 005—(Vocabulary Development): The teacher knows the importance of vocabulary development and applies that knowledge to teach reading, listening, speaking, and writing.

The beginning teacher:

- A. Knows how to provide explicit, systematic instruction and reinforcing activities to help students in grades 4–6 increase their vocabulary.
- B. Knows how to use formal and informal methods to effectively teach vocabulary to students in grades 4–6.
- C. Selects and uses a wide range of instructional materials (e.g., literary, informational, argumentative, multimodal, and digital texts), strategies, and opportunities with rich contextual support for vocabulary development for students in grades 4–6.
- D. Recognizes the importance of selecting, teaching, and modeling a wide range of general and specialized vocabularies for students in grades 4–6.
- E. Understands how to assess and monitor vocabulary knowledge for students in grades 4–6 by providing systematic, age-appropriate instruction and reinforcing activities (e.g., morphemic analysis, etymology, use of graphic organizers, contextual analysis, multiple exposures to a word in various contexts).
- F. Provides multiple opportunities to listen to, read, and respond to various types of literary and informational texts to promote the vocabulary development of students in grades 4–6.

Competency 006—(Reading, Inquiry, and Research): The teacher understands the importance of inquiry and research skills to students' academic success and provides instruction that promotes students' acquisition and effective use of these skills in the content areas.

The beginning teacher:

- A. Teaches students how to develop open-ended research questions and a plan (e.g., timeline) to locate, retrieve, and record information from a range of primary and secondary sources.
- B. Selects and uses instructional strategies to help students comprehend abstract content and ideas in written materials (e.g., examples, graphic organizers).
- C. Selects and uses instructional strategies to teach students to interpret information presented in various formats (e.g., maps, tables, graphs) and how to locate, retrieve, and record information from technologies, print resources, and experts.

- D. Selects and uses instructional strategies to help students use inquiry and research skills across the curriculum (e.g., brainstorming to generate questions and topics; locating, organizing, evaluating, summarizing, paraphrasing, and communicating information; differentiating between primary and secondary sources; selecting and using relevant, credible sources).
- E. Knows grade-level expectations for inquiry and research skills outlined in the Texas Essential Knowledge and Skills (TEKS) (e.g., in fourth and fifth grades, develop and follow a research plan with adult assistance; in sixth grade, refine the major research question through use of secondary questions).
- F. Provides instruction to develop a topic sentence, summarize findings, and use evidence to support conclusions.
- G. Understands how to foster collaboration with peers, with families, and with other professionals to promote all students' ability to develop effective inquiry and research skills in the content areas.

Competency 007—(Writing Conventions): The teacher understands the conventions of writing in English and provides instruction that helps students develop proficiency in applying writing conventions.

The beginning teacher:

- A. Understands that many students go through predictable stages in acquiring writing conventions (e.g., physical and cognitive processes involved in word writing, sentence construction, spelling, punctuation, grammatical expression) and that individual students vary in their rates of development of those conventions.
- B. Provides spelling instruction and gives students opportunities to use and develop spelling skills in the context of meaningful written expression (e.g., commonly confused terms, simple and complex contractions).
- C. Selects and uses instructional strategies, materials, and hands-on activities for developing graphomotor skills necessary for writing, according to grade-level expectations in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- D. Selects and uses instructional strategies, materials, and activities to help students use English writing conventions (e.g., grammar, capitalization, punctuation) in connected discourse.
- E. Recognizes the similarities and differences between spoken and written English (e.g., syntax, vocabulary choice, audience) and uses instructional strategies to help students apply English writing conventions and enhance their own writing.
- F. Knows writing conventions and appropriate grammar and usage and provides students with direct instruction and structured practice in those areas.
- G. Selects and uses instructional strategies, materials, and activities to teach correct pencil grip.

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

The beginning teacher:

- A. Teaches purposeful, meaningful writing in connection with listening, reading, and speaking.
- B. Knows how to promote students' development of an extensive reading and writing vocabulary by providing students with many opportunities to read and write.
- C. Monitors students' writing development and provides motivational instruction that addresses individual students' needs, strengths, and interests.

- D. Understands differences between first-draft writing and writing for publication and provides instruction in various stages of writing, including prewriting, drafting, revising (including both self-revision and peer revision), and editing.
- E. Understands the benefits of technology for teaching basic writing skills and writing for publication and provides instruction in the use of technology to facilitate written communication.
- F. Understands writing for a variety of audiences, purposes, and settings and provides students with opportunities to write for various audiences, purposes, and settings and in various voices and styles.
- G. Teaches students to use appropriate conventions to support ideas in writing and to use an appropriate form of documentation to acknowledge sources (e.g., quotations, bibliographical information, differentiation between paraphrasing and plagiarism).
- H. Knows grade-level expectations for written communication as described in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- I. Understands how to foster collaboration with families and with other professionals to promote students' development of writing skills.

Competency 009—(Viewing and Representing): The teacher understands skills for interpreting, analyzing, evaluating, and producing visual images and messages in various types of media, including electronic media, and provides students with opportunities to develop skills in this area.

The beginning teacher:

- A. Knows grade-level expectations for viewing and representing visual images and messages as described in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- B. Understands and teaches the characteristics and functions of different types of media (e.g., film, print) and knows how different types of media influence and inform.
- C. Teaches students to compare and contrast print, visual, and electronic media, including the level of formality of each (e.g., email, Web-based news article, blogs).
- D. Teaches students to evaluate how visual image makers (e.g., illustrators, documentary filmmakers, political cartoonists, news photographers) represent messages and meanings and provides students with opportunities to interpret and evaluate visual images in various media.
- E. Knows how to teach students to analyze visual image makers' choices (e.g., style, elements, media) and evaluate how those choices help represent or extend meaning.
- F. Provides students with opportunities to interpret events and ideas based on information from maps, charts, graphics, video segments, and technology presentations and to use media to compare ideas and points of view.
- G. Knows steps and procedures for teaching students to produce visual images and messages with various meanings to communicate with others.
- H. Teaches students how to select, organize, and produce visuals to complement and extend meanings.
- I. Provides students with opportunities to use technology for producing various types of communications (e.g., class newspapers, multimedia reports, video reports) and helps students analyze how language, medium, and presentation contribute to the message.
- J. Understands how to foster collaboration with families and with other professionals to promote students' development of media literacy.

Competency 010—(Assessment of Developing Literacy): The teacher understands the basic principles of literacy assessment and uses a variety of assessments to guide literacy instruction.

The beginning teacher:

- A. Knows how to select and administer formative and summative assessments to students in grades 4–6 and use results to measure literacy skills (e.g., word analysis and word identification skills, fluency, comprehension, writing conventions, written communications, visual images, inquiry skills) and address individual students' needs identified in informal and formal assessments.
- B. Knows the characteristics of informal and formal reading comprehension assessments (e.g., criterion-referenced state tests, curriculum-based reading assessments, informal reading inventories, norm-referenced tests).
- C. Analyzes students' reading and writing performance and uses the information as a basis for instruction in grades 4–6.
- D. Knows the state content and performance standards for reading, writing, listening, and speaking that constitute the Texas Essential Knowledge and Skills (TEKS) and recognizes when a student needs additional help or intervention to bring the student's performance up to grade level for students in grades 4–6.
- E. Knows how to determine students' independent, instructional, and frustration reading levels and uses the information to select appropriate materials for individual students and to guide students' selection of independent reading materials in grades 4–6.
- F. Uses ongoing assessments to determine when a student may be in need of classroom intervention or specialized reading instruction and to develop appropriate instructional plans for students in grades 4–6.
- G. Understands the use of writing in assessment of students and provides opportunities for students to self-assess and peer-assess writing (e.g., for clarity, interest to audience, comprehensiveness) and their ongoing literacy development.
- H. Knows how to select, administer, and use results from informal and formal assessments of literacy skills for students in grades 4–6.
- I. Analyzes students' errors in reading and responds to individual students' needs by providing focused instruction to promote literacy skills.
- J. Knows informal and formal procedures for assessing students' use of writing conventions and uses multiple, ongoing assessments to monitor and evaluate students' development in that area.
- K. Uses ongoing assessments of writing conventions to determine when students need additional help or intervention to bring students' performance to grade level based on state content and performance standards for writing in the Texas Essential Knowledge and Skills (TEKS) for grades 4–6.
- L. Analyzes students' errors in applying writing conventions and uses the results of the analysis as a basis for future instruction for students in grades 4–6.
- M. Selects and uses a variety of formal and informal procedures for monitoring students' reading comprehension and adjusts instruction to meet the needs of individual students, including English learners, for students in grades 4–6.
- N. Understands how to foster collaboration with families and how to communicate information about students' progress and ongoing literacy development to parents/caregivers and to other professionals through a variety of means, including the use of examples of students' work, for students in grades 4–6.

Subject Exam II—Mathematics (902)

Competency 001—(Mathematics Instruction): The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize and implement instruction and assess learning.

The beginning teacher:

- A. Plans appropriate instructional activities for all students by applying research-based theories and principles of learning mathematics.
- B. Employs instructional strategies that build on the linguistic, cultural and socioeconomic diversity of students and that relate to students' lives and communities.
- C. Plans and provides developmentally appropriate instruction that establishes transitions between concrete, symbolic and abstract representations of mathematical knowledge and that builds on students' strengths and addresses their needs.
- D. Understands how manipulatives and technological tools can be used appropriately to assist students in developing, comprehending and applying mathematical concepts.
- E. Creates a learning environment that motivates all students and actively engages them in the learning process by using a variety of interesting, challenging and worthwhile mathematical tasks in individual, small-group and large-group settings.
- F. Uses a variety of tools (e.g., counters, standard and nonstandard units of measure, rulers, protractors, scales, stopwatches, measuring containers, money, calculators, software) to strengthen students' mathematical understanding.
- G. Implements a variety of instructional methods and tasks that promote students' ability to do the mathematics described in the Texas Essential Knowledge and Skills (TEKS).
- H. Develops clear learning goals to plan, deliver, assess and reevaluate instruction based on the mathematics in the Texas Essential Knowledge and Skills (TEKS).
- I. Helps students make connections between mathematics and the real world, as well as between mathematics and other disciplines such as art, music, science, social science and business.
- J. Uses a variety of questioning strategies to encourage mathematical discourse and to help students analyze and evaluate their mathematical thinking.
- K. Uses a variety of formal and informal assessments and scoring procedures to evaluate mathematical understanding, common misconceptions and error patterns.
- L. Understands the relationship between assessment and instruction and knows how to evaluate assessment results to design, monitor and modify instruction to improve mathematical learning for all students, including English-language learners.
- M. Understands the purpose, characteristics and uses of various assessments in mathematics, including formative and summative assessments.
- N. Understands how mathematics is used in a variety of careers and professions and plans instruction that demonstrates how mathematics is used in the workplace.

Competency 002—(Number Concepts and Operations): The teacher understands concepts related to numbers, operations and algorithms and the properties of numbers.

The beginning teacher:

- A. Analyzes, creates, describes, compares and models relationships between number properties, operations and algorithms for the four basic operations involving integers, rational numbers and real numbers, including real-world situations.
- B. Demonstrates an understanding of equivalency among different representations of rational numbers and between mathematical expressions.
- C. Selects appropriate representations of real numbers (e.g., fractions, decimals, percents) for particular situations.
- D. Demonstrates an understanding of ideas from number theory (e.g., prime factorization, greatest common divisor, divisibility rules) as they apply to whole numbers, integers and rational numbers, and uses those ideas in problem situations.
- E. Understands the relative magnitude of whole numbers, integers, rational numbers and real numbers including the use of comparative language and sets of objects.
- F. Identifies and demonstrates an understanding of and uses of a variety of models and objects for representing numbers (e.g., fraction strips, diagrams, patterns, shaded regions, number lines).
- G. Uses a variety of concrete and visual representations to demonstrate the connections between operations and algorithms.
- H. Identifies, demonstrates and applies knowledge of counting techniques, including combinations, to quantify situations and solve math problems (e.g., to include forward, backward and skip counting, with or without models).
- I. Identifies, represents and applies knowledge of place value (e.g., to compose and decompose numbers), rounding and other number properties to perform mental mathematics and computational estimation with automaticity.
- J. Demonstrates a thorough understanding of fractions, including the use of various representations to teach fractions and operations involving fractions.
- K. Uses a variety of strategies to generate and solve problems that involve one or more steps, with fluency.

Competency 003—(Patterns and Algebra): The teacher understands concepts related to patterns, relations, functions and algebraic reasoning.

The beginning teacher:

- A. Illustrates relations and functions using concrete models, tables, graphs and symbolic and verbal representations, including real-world applications.
- B. Demonstrates an understanding of the concept of linear function using concrete models, tables, graphs and symbolic and verbal representations.
- C. Understands how to use algebraic concepts and reasoning to investigate patterns, make generalizations, formulate mathematical models, make predictions and validate results.
- D. Formulates implicit and explicit rules to describe and construct sequences verbally, numerically, graphically and symbolically.
- E. Knows how to identify, extend, and create patterns using concrete models, figures, numbers and algebraic expressions.
- F. Uses properties, graphs, linear and nonlinear functions and applications of relations and functions to analyze, model and solve problems in mathematical and real-world situations.

- G. Translates problem-solving situations into expressions and equations involving variables and unknowns.
- H. Models and solves problems, including those involving proportional reasoning, using concrete, numeric, tabular, graphic and algebraic methods (e.g., using ratios and percents with fractions and decimals).
- I. Determines the linear function that best models a set of data.
- J. Understands and describes the concept of and relationships among variables, expressions, equations, inequalities and systems in order to analyze, model and solve problems.
- K. Applies algebraic methods to demonstrate an understanding of whole numbers using any of the four basic operations.

Competency 004—(Geometry and Measurement): The teacher understands concepts and principles of geometry and measurement.

The beginning teacher:

- A. Applies knowledge of spatial concepts such as direction, shape and structure.
- B. Identifies, uses, understands and models the development of formulas to find lengths, perimeters, areas and volumes of geometric figures.
- C. Uses the properties of congruent triangles to explore geometric relationships.
- D. Identifies, uses and understands concepts and properties of points, lines, planes, angles, lengths and distances.
- E. Analyzes and applies the properties of parallel and perpendicular lines.
- F. Uses a variety of representations (e.g., numeric, verbal, graphic, symbolic) to analyze and solve problems involving angles and two- and three-dimensional figures such as circles, triangles, polygons, cylinders, prisms and spheres.
- G. Uses symmetry to describe tessellations and shows how they can be used to illustrate geometric concepts, properties and relationships.
- H. Understands measurement concepts and principles, including methods of approximation and estimation, and the effects of error on measurement.
- I. Explains, illustrates, selects and uses appropriate units of measurement to quantify and compare time, temperature, money, mass, weight, area, capacity, volume, percent, speed and degrees of an angle.
- J. Uses translations, rotations and reflections to illustrate similarities, congruencies and symmetries of figures.
- K. Develops, justifies and uses conversions within and between measurement systems.
- L. Understands logical reasoning, justification and proof in relation to the axiomatic structure of geometry and uses reasoning to develop, generalize, justify and prove geometric relationships.
- M. Understands attributes of various polygons, including names and how sides and angles of the polygon affect its attributes.
- N. Partitions or decomposes polygons to express areas as fractions of a whole or to find areas of nonstandard polygons.
- O. Demonstrates the value and relationships of United States coins and bills and uses appropriate symbols to name the value of a collection.
- P. Identifies, uses and understands the concepts and properties of geometric figures and their relationships.
- Q. Describes the key attributes of the coordinate plane and models the process of graphing ordered pairs.

Competency 005—(Probability and Statistics): The teacher understands concepts related to probability and statistics and their applications.

The beginning teacher:

- A. Investigates and answers questions by collecting, organizing and displaying data in a variety of formats as described in the Texas Essential Knowledge and Skills (TEKS) and draws conclusions from any data graph.
- B. Demonstrates an understanding of measures of central tendency (e.g., mean, median, mode) and range and uses those measures to describe a set of data.
- C. Explores concepts of probability through data collection, experiments and simulations.
- D. Uses the concepts and principles of probability to describe the outcome of simple and compound events.
- E. Determines probabilities by constructing sample spaces to model situations.
- F. Applies deep knowledge of the use of probability, in different scenarios, to make observations, draw conclusions and create relationships.
- G. Solves a variety of probability problems using combinations and geometric probability (e.g., probability as the ratio of two areas).
- H. Supports arguments, makes predictions and draws conclusions using summary statistics and graphs to analyze and interpret one-variable data.
- I. Applies knowledge of designing, conducting, analyzing and interpreting statistical experiments to investigate real-world problems.
- J. Generates, simulates and uses probability models to represent situations.
- K. Uses the graph of the normal distribution as a basis for making inferences about a population.

Competency 006—(Mathematical Processes): The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems and make mathematical connections within and outside of mathematics.

The beginning teacher:

- A. Understands the role of logical reasoning in mathematics and uses formal and informal reasoning to explore, investigate and justify mathematical ideas.
- B. Applies correct mathematical reasoning to derive valid conclusions from a set of premises.
- C. Applies principles of inductive reasoning to make conjectures and uses deductive methods to evaluate the validity of conjectures.
- D. Evaluates the reasonableness of a solution to a given problem.
- E. Understands connections among concepts, procedures and equivalent representations in areas of mathematics (e.g., algebra, geometry).
- F. Recognizes that a mathematical problem can be solved in a variety of ways and selects an appropriate strategy for a given problem.
- G. Expresses mathematical statements using developmentally appropriate language, standard English, mathematical language and symbolic mathematics.
- H. Communicates mathematical ideas using a variety of representations (e.g., numeric, verbal, graphic, pictorial, symbolic, concrete).

- I. Demonstrates an understanding of the use of visual media such as graphs, tables, diagrams and animations to communicate mathematical information.
- J. Demonstrates an understanding of estimation, including the use of compatible numbers, and evaluates its appropriate uses.
- K. Knows how to use mathematical manipulatives and a wide range of appropriate technological tools to develop and explore mathematical concepts and ideas.
- L. Demonstrates knowledge of the history and evolution of mathematical concepts, procedures and ideas.
- M. Recognizes the contributions that different cultures have made to the field of mathematics and the impact of mathematics on society and cultures.
- N. Demonstrates an understanding of financial literacy concepts and their application as these relate to teaching students (e.g., describes the basic purpose of financial institutions; distinguishes the difference between gross and net income; identifies various savings options; defines different types of taxes; identifies the advantages and disadvantages of different methods of payments, savings and credit uses and responsibilities).
- O. Applies mathematics to model and solve problems to manage financial resources effectively for lifetime financial security, as it relates to teaching students (e.g., distinguishes between fixed and variable expenses, calculates profit in a given situation, develops a system for keeping and using financial records, describes actions that might be taken to develop and balance a budget when expenses exceed income).

Subject Exam III—Social Studies (903)

Competency 001—(Social Science Instruction): The teacher understands and applies social science knowledge and skills to plan, organize and implement instruction and assess learning.

The beginning teacher:

- A. Understands the social studies content and performance standards that constitute the Texas Essential Knowledge and Skills (TEKS).
- B. Understands the vertical alignment of the social sciences in the Texas Essential Knowledge and Skills (TEKS) from grade level to grade level, including prerequisite knowledge and skills.
- C. Understands and uses social studies terminology correctly.
- D. Understands the implications of stages of student growth and development for designing and implementing effective learning experiences in the social sciences (e.g., knowledge of and respect for self, family and communities; sharing; following routines; working cooperatively in groups).
- E. Selects and applies effective, developmentally appropriate instructional practices, activities, technologies and materials to promote students' knowledge and skills in the social sciences.
- F. Selects and applies current technology as a tool for teaching and communicating social studies concepts.
- G. Selects and uses effective instructional strategies, activities, technologies and materials to promote students' knowledge and skills in the social sciences.
- H. Understands how to promote students' use of social science skills, vocabulary and research tools, including currently available technological tools.
- I. Applies instruction that relates skills, concepts and ideas across different social science disciplines.

- J. Provides and facilitates instruction that helps students make connections between knowledge and methods in the social sciences and in other content areas.
- K. Uses a variety of formal and informal assessments and knowledge of the Texas Essential Knowledge and Skills (TEKS) to determine students' progress and needs and to help plan instruction that addresses the strengths, needs and interests of all students, including English-language learners and students with special needs.
- L. Understands and relates practical applications of social science issues and trends.
- M. Creates maps and other graphics to represent geographic, political, historical, economic and cultural features, distributions and relationships.
- N. Communicates the value of social studies education to students, parents/caregivers, colleagues and the community.

Competency 002—(History): The teacher understands and applies knowledge of significant historical events and developments, multiple historical interpretations and ideas and relationships between the past, the present and the future as defined by the Texas Essential Knowledge and Skills (TEKS).

The beginning teacher:

- A. Demonstrates an understanding of historical points of reference in the history of Texas, the United States and the world (e.g., the Texas Revolution, the Republic of Texas and the annexation of Texas by the United States).
- B. Analyzes how individuals, events and issues shaped the history of Texas, the United States and the world.
- C. Demonstrates an understanding of similarities and differences among Native American groups in Texas, the United States and the Western Hemisphere before European colonization.
- D. Demonstrates an understanding of the causes and effects of European exploration and colonization of Texas, the United States and the Western Hemisphere.
- E. Analyzes the influence of various factors (e.g., geographic contexts, processes of spatial exchange, science, technology) on the development of societies.
- F. Understands common characteristics of communities past and present, including reasons people have formed communities (e.g., need for security, religious freedom, law and material well-being), ways in which different communities meet their needs (e.g., government, education, communication, transportation, recreation) and how historical figures, patriots and good citizens helped shape communities, states and nations.
- G. Demonstrates an understanding of basic concepts of culture and the processes of cultural adaptation, diffusion and exchange.
- H. Applies knowledge and analyzes the effects of scientific, mathematical and technological innovations on political, economic, social and environmental developments as they relate to daily life in Texas, the United States and the world.
- I. Demonstrates an understanding of historical information and ideas in relation to other disciplines.
- J. Demonstrates an understanding of how to formulate historical research questions and use appropriate procedures to reach supportable judgments and conclusions in the social sciences.
- K. Demonstrates an understanding of historical research and knows how historians locate, gather, organize, analyze and report information by using standard research methodologies.

- L. Knows the characteristics and uses of primary and secondary sources for historical research (e.g., databases, maps, photographs, media services, the Internet, biographies, interviews, questionnaires, artifacts); analyzes historical information from primary and secondary sources; understands and evaluates information in relation to bias, propaganda, point of view and frame of reference.
- M. Applies and evaluates the use of problem-solving processes, gathering of information, listing and considering options, considering advantages and disadvantages, choosing and implementing solutions and assessing the effectiveness of solutions.
- N. Applies and evaluates the use of decision-making processes to identify situations that require decisions: by gathering information, identifying options, predicting consequences and taking action to implement the decisions.
- O. Communicates and interprets historical information in written, oral and visual forms and translates information from one medium to another (e.g., written to visual, statistical to written or visual).
- P. Analyzes historical information by categorizing, comparing and contrasting, making generalizations and predictions and drawing inferences and conclusions (e.g., regarding population statistics, patterns of migration, voting trends and patterns).
- Q. Applies knowledge of the concept of chronology and its use in understanding history and historical events.
- R. Applies different methods of interpreting the past to understand, evaluate and support multiple points of view, frames of reference and the historical context of events and issues.
- S. Demonstrates an understanding of the foundations of representative government in the United States, significant individuals, events and issues of the Revolutionary era and challenges confronting the United States government in the early years of the Republic.
- T. Demonstrates an understanding of westward expansion and analyzes its effects on the political, economic and social development of the United States and Texas, including its effects on American Indian life.
- U. Analyzes ways that political, economic and social factors led to the growth of sectionalism and the Civil War.
- V. Understands individuals, issues and events involved in the Civil War and analyzes the effects of Reconstruction on the political, economic and social life of the United States and Texas.
- W. Demonstrates an understanding of major United States and Texas reform movements of the nineteenth and twentieth centuries (e.g., abolitionism, women's suffrage, civil rights, temperance).
- X. Demonstrates knowledge of boom and bust cycles of leading Texas industries (e.g., railroads, the cattle industry, oil and gas production, cotton, real estate, banking, computer technology).
- Y. Demonstrates an understanding of important individuals, issues and events of the twentieth and twenty-first centuries in Texas, the United States and the world (e.g., urbanization, Great Depression, the Dust Bowl, the Second World War, growth of the oil and gas industry).
- Z. Analyzes ways that particular contemporary societies reflect historical events (e.g., invasion, conquests, colonization, immigration).

Competency 003—(Geography and Culture): The teacher understands and applies knowledge of geographic relationships involving people, places and environments in Texas, the United States and the world; the teacher also understands and applies knowledge of cultural development, adaptation, diversity and interactions among science, technology and society as defined by the Texas Essential Knowledge and Skills (TEKS).

The beginning teacher:

- A. Analyzes and applies knowledge of key concepts in geography (e.g., location, distance, region, grid systems) and knows the locations and the human and physical characteristics (e.g., culture, diversity) of places and regions in Texas, the United States and the world.
- B. Analyzes ways that location (absolute and relative) affects people, places and environments (e.g., the location of renewable and nonrenewable natural resources such as fresh water, fossil fuels, fertile soils and timber).
- C. Analyzes how geographic factors have influenced the settlement patterns, economic development, political relationships and historical and contemporary societies, including those of Texas, the United States and the world.
- D. Demonstrates an understanding of physical processes (e.g., erosion, deposition, weathering; plate tectonics; sediment transfer; flows and exchanges of energy and matter in the atmosphere that produce weather and climate; weather patterns) and their effects on environmental patterns.
- E. Analyzes how humans adapt to, use and modify the physical environment and how the physical characteristics of places and human modifications to the environment affect human activities and settlement patterns.
- F. Demonstrates an understanding of the physical environmental characteristics of Texas, the United States and the world, past and present, and analyzes how humans have adapted to and modified the environment.
- G. Examines how developments in science and technology affect the physical environment; the growth of economies and societies; and definitions of, access to and the use of physical and human resources.
- H. Creates and interprets maps of places and regions that contain map elements, draws sketch maps that illustrate various places and regions, and uses the compass rose, grid system and symbols to locate places on maps and globes.
- I. Demonstrates an understanding of basic concepts of culture; processes of cultural adaptation, diffusion and exchange; and positive and negative qualities of a multicultural society.
- J. Demonstrates an understanding of the contributions made by people of various racial, ethnic and religious groups.
- K. Analyzes the effects of race, gender, socioeconomic class, status and stratification on ways of life in Texas, the United States and the world.
- L. Identifies, explains and compares various ethnic and/or cultural customs, celebrations and traditions.
- M. Demonstrates an understanding of relationships among cultures of people from various groups, including racial, ethnic and religious groups, in the United States and throughout the world (e.g., conflict and cooperation among cultures; factors that influence cultural change, such as improved communication, transportation and economic development).
- N. Compares and analyzes similarities and differences in the ways various peoples at different times in history have lived and have met basic human needs, including the various roles of men, women, children and families in past and present cultures.
- O. Compares similarities and differences among Native American groups in Texas, the United States and the Western Hemisphere before European colonization.
- P. Applies knowledge of the role of families in meeting basic human needs and how families and cultures develop and use customs, traditions and beliefs to define themselves.
- Q. Understands and applies the concept of diversity within unity.

- R. Relates geographic and cultural information and ideas to information and ideas in other social sciences and other disciplines.
- S. Formulates geographic and cultural research questions and uses appropriate procedures to reach supportable judgments and conclusions.
- T. Demonstrates an understanding of research related to geography and culture and knows how social scientists in those fields locate, gather, organize, analyze and report information using standard research methodologies.
- U. Demonstrates an understanding of the characteristics and uses of various primary and secondary sources (e.g., databases, maps, photographs, media services, the Internet, biographies, interviews, questionnaires, artifacts); utilizes information from a variety of sources to acquire social science information; answers social science questions; and evaluates information in relation to bias, propaganda, point of view and frame of reference.
- V. Applies evaluative, problem-solving and decision-making skills to geographic and cultural information, ideas and issues by identifying problems, gathering information, listing and considering options, considering advantages and disadvantages, choosing and implementing solutions, and assessing the solutions' effectiveness.
- W. Communicates and interprets geographic and cultural information in written, oral and visual form (e.g., maps and other graphics) and translates the information from one medium to another (e.g., written to visual, statistical to written or visual).
- X. Analyzes geographic and cultural data using geographical tools and basic mathematical and statistical concepts and analytic methods.
- Y. Understands and analyzes the characteristics, distribution and migration of populations and the interactions between people and the physical environment, including the effects of those interactions on the development of Texas, the United States and the world.
- Z. Demonstrates knowledge of the institutions that exist in all societies and how the characteristics of those institutions may vary among societies.
- AA. Demonstrates an understanding of how people use oral tradition, stories, real and mythical heroes, music, paintings and sculpture to represent culture in communities in Texas, the United States and the world (e.g., importance of individual writers and artists to the cultural heritage of communities; significant examples of art, music and literature from various periods).
- AB. Understands the relationship between the arts and the times and societies in which they are produced, including how past and contemporary issues influence creative expressions, and identifies examples of art, music and literature that have transcended the boundaries of societies and convey universal themes such as religion, justice and the passage of time.
- AC. Analyzes relationships among religion, philosophy and culture and their effect on ways of life in Texas, the United States and the world.
- AD. Understands and analyzes how changes in science and technology relate to political, economic, social and cultural issues and events.

Competency 004—(Economics): The teacher understands and applies knowledge of economic systems and how people organize economic systems to produce, distribute and consume goods and services.

The beginning teacher:

- A. Compares and contrasts similarities and differences in how various peoples at different times in history have lived and met basic human needs, including the various roles of men, women, children and families in past and present cultures.

- B. Understands and applies knowledge of basic economic concepts (e.g., economic system, goods and services, free enterprise, interdependence, needs and wants, scarcity, roles of producers and consumers, factors of production, specialization and trade, entrepreneurship); knows that basic human needs are met in many ways; and understands the value and importance of work and of spending, saving and budgeting money.
- C. Demonstrates knowledge of the ways people organize economic systems and of the similarities and differences among various economic systems around the world.
- D. Understands and applies the knowledge of the characteristics, benefits and development of the free-enterprise system in Texas and the United States and how businesses operate in the United States free-enterprise system (e.g., importance of morality and ethics in maintaining a functional free-enterprise system and the impact of past and present entrepreneurs).
- E. Applies knowledge of the effects of supply and demand on consumers and producers in a free-enterprise system.
- F. Demonstrates knowledge of patterns of work and economic activities in Texas and the United States, past and present, including the roles of consumers and producers, and the impact of geographic factors, immigration, migration, limited resources, mass production, specialization and division of labor, and American ideas about progress and equal opportunity.
- G. Demonstrates knowledge of categories of economic activities, economic indicators and how a society's economic level is measured.
- H. Understands the effects of government regulation and taxation on consumers, economic development and business planning.
- I. Demonstrates an understanding of major events, trends and issues in economic history (e.g., factors leading societies to change from rural to urban or agrarian to industrial, economic reasons for exploration and colonization, economic forces leading to the Industrial Revolution, processes of economic development in different areas of the world, factors leading to the emergence of different patterns of economic activity in the various regions of the United States).
- J. Analyzes the interdependence of the Texas economy with those of the United States and the world.

Competency 005—(Government and Citizenship): The teacher understands and applies knowledge of concepts of government, democracy and citizenship, including ways that individuals and groups achieve their goals through political systems.

The beginning teacher:

- A. Demonstrates knowledge of historical origins of democratic forms of government, such as ancient Greece.
- B. Understands and applies the purpose of rules and laws; the relationship between rules, rights and responsibilities; the fundamental rights of American citizens guaranteed in the Bill of Rights and other amendments to the United States Constitution; and the individual's role in making and enforcing rules and ensuring the welfare of society.
- C. Understands the basic structure and functions of the United States government, the Texas government and local governments (including the roles of public officials); the relationships among national, state and local governments; and how local, state and national government services are financed.
- D. Demonstrates knowledge of key principles and ideas contained in major political documents of Texas and the United States (e.g., the Declaration of Independence, United States Constitution, Texas Constitution) and of relationships among political documents.

- E. Demonstrates an understanding of how people organized governments in colonial America and during the early development of Texas.
- F. Understands the political processes in the United States and Texas and how the United States political system works.
- G. Demonstrates knowledge of types of government (e.g., democratic, totalitarian, monarchical) and their respective levels of effectiveness in meeting citizens' needs (e.g., reasons for limiting the power of government, record of human rights abuses by limited and unlimited governments).
- H. Understands the formal and informal processes of changing the United States and Texas Constitutions and the impact of changes on society.
- I. Understands and promotes students' understanding of the impact of landmark Supreme Court cases.
- J. Understands the components of the democratic process (e.g., voluntary individual participation, effective leadership, expression of different points of view, the selection of public officials) and their significance in a democratic society.
- K. Understands the importance of effective leadership in a constitutional republic and identifies past and present leaders in state, local and national governments and their leadership qualities and contributions.
- L. Demonstrates knowledge of important customs, symbols, landmarks and celebrations that represent American and Texan beliefs and principles and contribute to national unity.
- M. Analyzes the relationships between individual rights, responsibilities and freedoms in democratic societies.
- N. Applies knowledge of the rights and responsibilities of citizens and nonprofit and civic groups in Texas and the United States, past and present, and understands characteristics of good citizenship (e.g., community service) as exemplified by historical and contemporary figures.
- O. Understands how the nature, rights and responsibilities of citizenship vary among societies.

Subject Exam IV—Science (904)

Competency 001—(Lab Processes, Equipment and Safety): The teacher understands how to manage learning activities, tools, materials, equipment and technologies to ensure the safety of all students.

The beginning teacher:

- A. Understands safety regulations and guidelines for science facilities and science instruction.
- B. Knows procedures for and sources of information regarding the appropriate handling, use, disposal, care and maintenance of chemicals, materials, specimens and equipment.
- C. Knows procedures for the safe handling and ethical care and treatment of organisms and specimens.
- D. Selects and safely uses appropriate tools, technologies, materials and equipment needed for instructional activities.
- E. Understands concepts of precision, accuracy and error with regard to reading and recording numerical data from a scientific instrument.
- F. Understands how to gather, organize, display and communicate data in a variety of ways (e.g., charts, tables, graphs, diagrams, written reports, oral presentations).
- G. Understands the international system of measurement (i.e., metric system) and performs unit conversions within measurement systems, including the use of nonstandard units.

Competency 002—(History and Nature of Science): The teacher understands the history and nature of science, the process and role of scientific inquiry and the role of inquiry in science instruction.

The beginning teacher:

- A. Understands, plans, designs and implements instruction that provides opportunities for all students to engage in nonexperimental- and experimental-inquiry investigations.
- B. Focuses inquiry-based instruction on questions and issues relevant to students and uses strategies to assist students with generating, refining and focusing scientific questions and hypotheses.
- C. Understands and instructs students in the safe and proper use of a variety of grade-appropriate tools, equipment, resources, technology and techniques to access, gather, store, retrieve, organize and analyze data.
- D. Knows how to guide students in making systematic observations and measurements and posing questions to guide investigations.
- E. Knows how to promote the use of critical-thinking skills, logical reasoning and scientific problem solving to reach conclusions based on evidence.
- F. Knows how to teach students to develop, analyze and evaluate different explanations for a given scientific result, including that repeated investigations may increase reliability.
- G. Knows how to teach students to demonstrate an understanding of potential sources of error in inquiry-based investigation.
- H. Knows how to teach students to demonstrate an understanding of how to communicate and defend the results of an inquiry-based investigation.
- I. Understands principles of scientific ethics.
- J. Understands the roles that logical reasoning, verifiable evidence, prediction and peer review play in the process of generating and evaluating scientific knowledge.
- K. Understands the historical development of science (e.g., cell theory, plate tectonics, laws of motion, universal gravity) and technology and the contributions that diverse cultures and individuals of both genders have made to scientific and technological knowledge.

Competency 003—(Impact of Science): The teacher understands how science impacts the daily lives of students and interacts with and influences personal and societal decisions.

The beginning teacher:

- A. Understands that decisions about the use of science are based on factors such as ethical standards, economics and personal and societal needs.
- B. Applies scientific principles to analyze the advantages of, disadvantages of or alternatives to a given decision or course of action.
- C. Applies scientific principles and processes to analyze factors that influence personal choices concerning fitness and health, including physiological and psychological effects and risks associated with the use of substances and substance abuse.
- D. Understands concepts, characteristics and issues related to changes in populations and human population growth.
- E. Identifies and understands the types and uses of natural resources and the effects of human consumption on the renewal and depletion of resources.

- F. Understands the role science and scientists can play in helping resolve personal, societal and global challenges.

Competency 004—(Concepts and Processes): The teacher knows and understands the unifying concepts and processes that are common to all sciences.

The beginning teacher:

- A. Understands how a unifying, explanatory framework across the science disciplines is provided by the concepts and processes of systems, order and organization; evidence, models and explanation; change, constancy and measurements; and form and function.
- B. Demonstrates an understanding of how patterns in observations and data can be used to make explanations and predictions.
- C. Analyzes interactions and interrelationships between systems and subsystems.
- D. Applies unifying concepts to explore similarities in a variety of natural phenomena.
- E. Understands how properties and patterns of systems can be described in terms of space, time, energy and matter.
- F. Understands how change and constancy occur in systems.
- G. Understands the complementary nature of form and function in a given system.
- H. Understands how models are used to represent the natural world and how to evaluate the strengths and limitations of a variety of scientific models (e.g., physical, conceptual, mathematical).

Competency 005—(Students as Learners and Science Instruction): The teacher has theoretical and practical knowledge about teaching science and about how students learn science.

The beginning teacher:

- A. Understands how developmental characteristics, prior knowledge and experience and students' attitudes influence science learning.
- B. Selects and adapts science curricula, content, instructional materials, collaborations, vocabulary and activities to meet the levels of interest, knowledge and understanding as well as the abilities, experiences and needs of all students, including English-language learners.
- C. Understands how to use situations from students' daily lives to develop instructional materials that investigate how science can be used to make informed decisions.
- D. Understands common misconceptions in science and has effective ways to address those misconceptions.
- E. Understands developmentally appropriate design and implementation of hands-on learning experiences in science and selects effective, appropriate instructional practices, activities, technologies and materials to promote students' scientific knowledge, skills and inquiry processes.
- F. Understands questioning strategies designed to elicit higher-level thinking and how to use them to move students from concrete to more abstract understanding.
- G. Understands the importance of planning activities that are inclusive and that accommodate the needs of all students.
- H. Understands how to sequence learning activities in a way that enables students to build on their prior knowledge and that challenges them to expand their understanding of science.

Competency 006—(Science Assessment): The teacher knows the varied and appropriate assessments and assessment practices for monitoring science learning in laboratory, field and classroom settings.

The beginning teacher:

- A. Understands the relationships between a science curriculum, assessment and instruction and bases instruction on information gathered through assessment of students' strengths and needs.
- B. Understands the importance of monitoring and assessing students' understanding of science concepts and skills on an ongoing basis, including how to use formal and informal assessments of student performance and how to use products (e.g., projects, lab journals, rubrics, portfolios, student profiles, checklists) to evaluate students' understanding of and participation in the inquiry process.
- C. Selects — or designs — and administers a variety of appropriate assessments (e.g., performance assessment, self-assessment, formal/informal assessment, formative/summative assessment) to monitor students' understanding and progress and to plan for instruction.
- D. Understands the importance of communicating evaluation criteria and assessment results to students.

Competency 007—(Forces and Motion): The teacher understands forces and motion and their relationships.

The beginning teacher:

- A. Demonstrates an understanding of the properties of universal forces (e.g., gravitational, electrical, magnetic).
- B. Understands how to measure, graph and describe changes in motion by using concepts of position, direction of motion and speed.
- C. Analyzes the ways unbalanced forces acting on an object cause changes in the position or motion of the object.
- D. Analyzes the relationship between force and motion in a variety of situations (e.g., simple machines, geologic processes).

Competency 008—(Physical and Chemical Properties): The teacher understands the physical and chemical properties of and changes in matter.

The beginning teacher:

- A. Describes and measures the physical and chemical properties of substances (e.g., size, shape, temperature, magnetism, hardness, mass, conduction, density).
- B. Describes the physical properties of solids, liquids and gases.
- C. Distinguishes between physical and chemical changes in matter.
- D. Applies knowledge of physical and chemical properties (including atomic structure) of and changes in matter to processes and situations that occur in life and in earth and space science.
- E. Distinguishes between elements, compounds, mixtures and solutions and describes their properties.
- F. Describes and explains the occurrence and importance of a variety of chemical reactions that occur in daily life (e.g., rusting, burning of fossil fuels, photosynthesis, cell respiration, chemical batteries, digestion of food).

Competency 009—(Energy and Interactions): The teacher understands energy and interactions between matter and energy.

The beginning teacher:

- A. Understands conservation of energy and energy transformations and analyzes how energy is transformed from one form to another (e.g., potential, kinetic, mechanical, sound, heat, light, chemical, electrical) in a variety of everyday situations and how increasing or decreasing amounts affect objects.
- B. Understands the basic concepts of heat energy and related processes (e.g., melting, evaporation, boiling, condensation, conduction, convection, and radiation).
- C. Understands the principles of electricity and magnetism and their applications (e.g., electric circuits, electromagnetic fields, motors, audio speakers, lightning).
- D. Applies knowledge of properties of light (e.g., reflection, refraction) to describe the functioning of optical systems and phenomena (e.g., camera, microscope, rainbow, eye).
- E. Demonstrates an understanding of the properties, production, and transmission of sound.

Competency 010—(Energy Transformations and Conservation): The teacher understands energy transformations and the conservation of matter and energy.

The beginning teacher:

- A. Describes sources of electrical energy and processes of energy transformation for human uses (e.g., fossil fuels, solar panels, hydroelectric plants).
- B. Applies knowledge of transfer of energy in a variety of situations (e.g., the production of heat, light, sound and magnetic effects by electrical energy; the process of photosynthesis; weather processes; food webs; food and energy pyramids).
- C. Understands applications of energy transformations and the conservation of matter and energy in life and in earth and space science.

Competency 011—(Structure and Function of Living Things): The teacher understands the structure and function of living things.

The beginning teacher:

- A. Understands that living systems have different structures that perform different functions.
- B. Understands and describes stages in the life cycles of common plants and animals (including animals that experience complete and incomplete metamorphosis).
- C. Understands that organisms have basic needs.
- D. Analyzes how structure complements function in cells, tissues, organs, organ systems and organisms.
- E. Identifies human body systems and describes their functions.
- F. Understands the relationship between characteristics, structures, and functions and corresponding taxonomic classifications.

Competency 012—(Reproduction and the Mechanisms of Heredity): The teacher understands reproduction and the mechanisms of heredity.

The beginning teacher:

- A. Describes the processes by which plants and animals reproduce and explains how hereditary information is passed from one generation to the next.

- B. Compares and contrasts inherited traits and learned characteristics.
- C. Understands the organization of hereditary material and how an inherited trait can be determined by one or many genes and how more than one trait can be influenced by a single gene.
- D. Distinguishes between dominant and recessive traits and predicts the probable outcomes of genetic combinations.
- E. Evaluates the influence of environmental and genetic factors on the traits of an organism.

Competency 013—(Adaptations and Evolution): The teacher understands adaptations of organisms and the theory of evolution.

The beginning teacher:

- A. Demonstrates knowledge of adaptive characteristics and explains how adaptations influence the survival of populations or species.
- B. Describes how populations and species change through time.
- C. Describes processes that enable traits to change through time, including selective breeding, mutation and other natural occurrences.

Competency 014—(Organisms and the Environment): The teacher understands the relationships between organisms and the environment.

The beginning teacher:

- A. Understands that organisms respond to internal or external stimuli and analyzes the role of internal and external stimuli in the behavior of organisms.
- B. Understands relationships between organisms and the environment and describes ways that living organisms depend on each other and on the environment to meet their basic needs.
- C. Identifies organisms, populations or species with similar needs and analyzes how they compete with one another for resources.
- D. Analyzes the interrelationships and interdependence among producers, consumers and decomposers in an ecosystem (e.g., food webs, food chains, competition, predation).
- E. Identifies factors that influence the size and growth of populations in an ecosystem.
- F. Analyzes adaptive characteristics that result in a population's or species' unique niche in an ecosystem.
- G. Knows how populations and species modify and affect ecosystems.

Competency 015—(Structure and Function of Earth Systems): The teacher understands the structure and function of Earth systems.

The beginning teacher:

- A. Understands the structure of Earth and analyzes constructive and destructive processes (including plate tectonics, weathering and erosion) that produce geologic change, including how these processes have affected Earth history.
- B. Understands the form and function of surface water and groundwater.
- C. Applies knowledge of the composition and structure of the atmosphere and its properties.

- D. Applies knowledge of how human activity and natural processes, both gradual and catastrophic, can alter Earth systems.

Competency 016—(Cycles in Earth Systems): The teacher understands cycles in Earth systems.

The beginning teacher:

- A. Understands the rock cycle and how rocks, minerals and soils are formed, and their respective properties.
- B. Understands the water cycle and its relationship to weather processes.
- C. Understands the nutrient (e.g., carbon, nitrogen) cycle and its relationship to Earth systems.
- D. Applies knowledge of how human and natural processes affect Earth systems.
- E. Understands and describes the properties and uses of Earth materials (e.g., rocks, soils, water, atmospheric gases).

Competency 017—(Energy in Weather and Climate): The teacher understands the role of energy in weather and climate.

The beginning teacher:

- A. Understands the elements of weather (e.g., humidity, wind speed and direction, air pressure, temperature) and the tools used for measurement.
- B. Compares and contrasts weather and climate.
- C. Analyzes weather charts and data to make weather predictions.
- D. Applies knowledge of how transfers of energy between Earth systems affect weather and climate.
- E. Analyzes how Earth's position, orientation, and surface features affect weather and climate.

Competency 018—(Solar System and the Universe): The teacher understands the characteristics of the solar system and the universe.

The beginning teacher:

- A. Understands the properties and characteristics of objects in the sky.
- B. Applies knowledge of the Earth–Moon–Sun system and the interactions among them (e.g., day and night, seasons, lunar phases, eclipses).
- C. Identifies properties of the components of the solar system.

Subject Exam V—Fine Arts, Health and Physical Education (905)

Competency 001—(Visual Arts): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of art and uses that knowledge to plan and implement effective and engaging visual arts instruction.

The beginning teacher:

- A. Knows how to involve students in activities that promote enjoyment and understanding of visual arts by providing students with a wide range of opportunities to create and respond to visual arts so that they develop visual arts literacy.

- B. Knows and understands how perception is developed through observation, prior knowledge, imaginative and cognitive processes and multisensory experiences.
- C. Selects and uses instructional strategies, materials and activities to help students deepen and expand their ability to perceive and reflect on the environment.
- D. Knows and understands how critical thinking and creative problem solving are applied in the perception of artworks.
- E. Demonstrates knowledge of the elements of art (i.e., color, texture, shape, form, line, space, value) and provides instruction that promotes students' understanding of the elements of art as well as students' ability to apply that understanding in creating original artworks.
- F. Demonstrates knowledge of the principles of art (e.g., emphasis, contrast, pattern, rhythm, balance, proportion, unity) and provides instruction that promotes students' understanding of the principles of art as well as students' ability to apply that understanding in creating original artworks.
- G. Selects appropriate techniques to create art in various media (e.g., drawing, painting, printmaking, construction, ceramics, fiber art, electronic media) and promotes students' ability to use those techniques in creating original artworks.
- H. Understands how different cultures use art elements and principles to create art and convey meaning in different ways.
- I. Selects and uses instructional strategies, materials and activities to promote students' awareness and appreciation of the characteristics of a variety of art forms of multiple cultures within and outside the Western tradition.
- J. Provides instruction to develop the skills and knowledge required for visual literacy (e.g., art elements and principles, art of different areas and cultures, diverse purposes and uses of art).
- K. Integrates instruction in the visual arts with instruction in other subject areas.
- L. Understands how students develop cognitively and artistically and knows how to implement effective art instruction and assessment that are individually, culturally and age appropriate.
- M. Applies knowledge of visual arts content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and knowledge of students in early childhood through grade six to plan and implement effective, developmentally appropriate art instruction.

Competency 002—(Music): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of music and uses that knowledge to plan and implement effective and engaging music instruction.

The beginning teacher:

- A. Knows how to involve students in activities that promote enjoyment and understanding of music by providing students with a wide range of opportunities to make and respond to music so that they develop music literacy (e.g., concert attendance, authentic performance opportunities).
- B. Applies knowledge of standard terminology for describing and analyzing musical sound (e.g., rhythm, melody, form, timbre, tempo, pitch, meter, dynamics, intonation, intervals) and has a basic understanding of how to read, write, recognize aurally and interpret standard music notation.
- C. Knows how to arrange vocal and instrumental music for specific purposes and settings (e.g., guides students in creating simple song arrangements and accompaniments using voices, classroom percussion, and melody instruments).
- D. Knows and understands music of diverse genres, styles and cultures.

- E. Demonstrates an understanding of the purposes and roles of music in society and how music can reflect elements of a specific society or culture.
- F. Explains a variety of music and music-related career options.
- G. Identifies and describes how music reflects the heritage of the United States and Texas.
- H. Applies knowledge of criteria for evaluating and critiquing musical performances and experiences, including using standard terminology in communicating about students' musical skills and performance abilities.
- I. Integrates instruction in music with instruction in other subject areas.
- J. Knows how to teach students to sing and/or play an instrument with expression, both independently and in small groups.
- K. Applies knowledge of music content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and of students in early childhood through grade six to plan and implement effective, developmentally appropriate instruction, including instruction that promotes students' creativity and performance skills as well as students' ability to use critical-thinking and problem-solving skills in music contexts (e.g., sequential instruction, music composition, improvisation, concert etiquette).
- L. Manages time, instructional resources and physical space effectively for music education.

Competency 003—(Health): The teacher uses knowledge of the concepts and purposes of health education to plan and implement effective and engaging health instruction.

The beginning teacher:

- A. Understands health-related behaviors, ways that personal health decisions and behaviors affect body systems and health and strategies for reducing health risks and enhancing wellness throughout the life span.
- B. Demonstrates knowledge of major areas in health instruction, including body systems and development (e.g., structures and functions of various body systems, relationships among body systems, five senses); illness and disease (e.g., types of disease, transmission mechanisms, defense systems, disease prevention); nutrition (e.g., types of foods and nutrients, maintenance of a balanced diet); stress (e.g., effects of stress, stress-reduction techniques); and fitness (e.g., components of fitness, methods for improving fitness, posture).
- C. Knows and understands stages of human growth and development, including physical and emotional changes that occur during adolescence.
- D. Understands substance use and abuse, including types and characteristics of tobacco, alcohol, other drugs and herbal supplements.
- E. Understands types of violence and abuse, including causes and effects of violence and abuse and ways to prevent and seek help in dealing with violence and abuse.
- F. Selects and uses instructional strategies, materials and activities to teach principles and procedures related to safety, accident prevention and response to emergencies.
- G. Applies critical-thinking, goal-setting, problem-solving and decision-making skills in health-related contexts (e.g., eating habits, drug use, abstinence) and understands the use of refusal skills and conflict resolution to avoid unsafe situations (e.g., bullying, violence, abuse).
- H. Knows and understands strategies for coping with unhealthy behaviors in the family (e.g., abuse, alcoholism, neglect, anxiety, grief).
- I. Understands types and symptoms of eating disorders.

- J. Knows how to use various social and communication skills to build and maintain healthy interpersonal relationships (e.g., tolerance, respect, discussing problems with parents/caregivers, showing empathy).
- K. Understands health care responses to threats to safety, internal injury, early detection and warning signs of illness.
- L. Selects and uses instructional strategies, materials and activities to help students build healthy interpersonal relationships (e.g., communication skills) and demonstrates consideration and respect for self, family, friends and others (e.g., practicing self-control).
- M. Understands the influence of various factors (e.g., media, technology, peer and other relationships, environmental hazards) on individual (e.g., idealized body images, unhealthy weight-loss plans), family and community health.
- N. Demonstrates knowledge of sources of health information and ways to use information to make health-related decisions.
- O. Selects and uses instructional strategies, materials and activities to help students understand the roles of health care professionals, the benefits of health maintenance activities and the skills for becoming health-conscious consumers.
- P. Applies knowledge of health content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and of students in early childhood through grade six to plan and implement effective, developmentally appropriate health instruction, including relating the health education curriculum to other content areas.

Competency 004—(Physical Education): The teacher uses knowledge of the concepts, principles, skills and practices of physical education to plan and implement effective and engaging physical education instruction.

The beginning teacher:

- A. Applies key principles and concepts in physical education and physical activity (e.g., cardiovascular endurance, muscular strength, flexibility, weight control, conditioning, safety, stress management, nutrition) for the promotion of health and fitness.
- B. Knows and helps students understand the benefits of an active lifestyle.
- C. Understands appropriate methods, including technological methods, for evaluating, monitoring and improving fitness levels.
- D. Applies knowledge of movement principles and concepts to develop students' motor skills including understanding key elements of mature movement patterns (e.g., throwing, jumping, catching) and various manipulative skills (e.g., volley, dribble, punt, strike).
- E. Selects and uses developmentally appropriate learning experiences that enhance students' locomotor, nonlocomotor, body control, manipulative and rhythmic skills.
- F. Modifies instruction based on students' individual differences in growth and development.
- G. Evaluates movement patterns to help students improve performance of motor skills and to integrate and refine their motor and rhythmic skills.
- H. Understands a variety of strategies and tactics designed to improve students' performance, teamwork and skill combinations in games and sports.
- I. Selects and uses instructional strategies to promote students' knowledge and application of rules, procedures, etiquette and fair play in developmentally appropriate games and activities.
- J. Designs, manages and adapts physical education activities to promote positive interactions and active engagement by all students.

- K. Understands areas of diverse needs (e.g., physical and emotional challenges, learning disabilities, sensory difficulties, language differences) and their implications for teaching and learning.
- L. Applies knowledge of physical education content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and knowledge of students in early childhood through grade six to plan, implement and assess effective, developmentally appropriate physical education activities.

Competency 005—(Theatre): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of theatre and uses that knowledge to plan and implement effective and engaging theatre instruction.

The beginning teacher:

- A. Knows and understands how perception is developed through the use of elements of drama and conventions of theatre.
- B. Knows how to involve students in activities that promote enjoyment and understanding of theatre arts by selecting and using instructional strategies, materials and activities to help students interpret creative expression and performance.
- C. Demonstrates the knowledge of the elements of theatre (i.e., dramatic play, expressive movement, voice, characterization) and theatre occupations, provides instruction that promotes students' understanding of the elements and occupations, and helps them apply that understanding in creating theatrical productions.
- D. Integrates instruction in theatre with instruction in other subject areas.
- E. Knows how to promote students' ability to identify and use technical elements (e.g., properties, scenery, sound, costumes, lighting) to create suitable environments for dramatic play and performance.
- F. Knows how to promote students' ability to identify and use technical elements (e.g., properties, scenery, sound, costumes, lighting) to define and enhance characterization, mood, theme and setting.
- G. Understands how theatre relates to history, society and the diverse cultures.
- H. Applies knowledge of theatre content and curriculum based on the Texas Essential Knowledge and Skills (TEKS) and knowledge of students in early childhood through grade six to plan and implement effective, developmentally appropriate theatre instruction.
- I. Manages time, instructional resources and physical space effectively for theatre education.

Preparation Manual

Section 4: Sample Selected-Response Questions Core Subjects EC–6 Subject Exam I—English Language Arts and Reading (901)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how a competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam I Sample Questions

Competency 001—(Oral Language): The teacher understands the importance of oral language, knows the developmental processes of oral language, and provides students with varied opportunities to develop listening and speaking skills.

1. A fourth-grade teacher notices several students who are shy and reluctant to speak in class. What strategy would be most effective in motivating students' participation in class while enhancing their listening and speaking skills?

- A. Allowing students regular opportunities to read aloud in front of the class
- B. Giving students opportunities to share and listen to stories in a small-group setting
- C. Encouraging students to orally respond to higher-level thinking questions during class
- D. Permitting students to choose which groups of students they feel comfortable speaking to

Answer _____

2. A fifth-grade teacher includes a read-aloud as part of the language arts block. Which of the following steps would be most appropriate for the teacher to take to help develop students' oral language skills and support students' comprehension of the read-aloud texts?

- A. Grouping students by reading level to complete differentiated activities related to the read-aloud texts
- B. Giving students multiple-choice questions about the main ideas and key details of the read-aloud texts
- C. Providing students with opportunities to use a think-pair-share strategy to discuss the read-aloud texts
- D. Determining students' language development levels before choosing the read-aloud texts

Answer _____

3. A fourth-grade teacher has students write about a specific topic from the current social studies unit and discuss their written response with a group of classmates. The primary purpose for this type of activity is to develop the students'

- A. short-term memory.

- B. oral language skills.
- C. writing skills.
- D. comprehension.

Answer _____

Competency 003—(Reading Fluency): The teacher understands the importance of fluency for reading comprehension and provides many opportunities for students to improve their reading fluency.

4. Which of the following silent reading practices provides the best conditions for students' individual reading improvement?

- A. Engaging in sustained silent reading for an hour once a week while the teacher reads a book to model engaged reading behaviors
- B. Dropping everything and reading several times a week for 30 minutes while the teacher grades papers or prepares instructional materials
- C. Reading silently any time independent work has been completed early while the teacher keeps anecdotal records of student behaviors
- D. Participating in scaffolded silent reading for 20 minutes every day while the teacher confers with students individually about their reading

Answer _____

Competency 004—(Reading Comprehension and Applications): The teacher understands the importance of reading for understanding, knows the components and processes of reading comprehension, and teaches students strategies for improving their comprehension, including using a variety of texts and contexts.

5. During a unit on propaganda, a sixth-grade teacher asks students to evaluate short statements made in advertising materials and to attempt to detect any faulty reasoning. Which of the following levels of reading comprehension is primarily being targeted in the lesson?

- A. Literal
- B. Inferential
- C. Evaluative
- D. Appreciative

Answer _____

6. Fifth-grade students are preparing to read a short story about two children's visit to a New York City zoo. Which of the following activities is the best way to introduce the text to promote reading comprehension?

- A. Completing a KWL chart
- B. Listening to the story on audio
- C. Writing about their own experiences in New York City
- D. Identifying New York City on a map

Answer _____

Competency 005—(Vocabulary Development): The teacher knows the importance of vocabulary development and applies that knowledge to teach reading, listening, speaking, and writing.

7. When selecting vocabulary from magazine or newspaper articles used in instruction, which of the following methods is most effective?

- A. Selecting vocabulary based on the teacher's experience from previous years of instruction
- B. Asking students to identify words for further study when they read an article for the first time
- C. Using newspapers and magazines specifically made for school use, with bolded vocabulary terms
- D. Cross-referencing articles taught in class with district vocabulary lists to identify key words

Answer _____

8. As part of a unit in which students explore the most significant scientific discoveries in the last hundred years, a fifth-grade teacher wants to include activities that expand students' understanding of new vocabulary learned in the unit. Which of the following activities would likely be most effective for this purpose?

- A. Sorting newly learned words into labeled categories
- B. Working with a peer to memorize word meanings
- C. Recording definitions of unknown words in a journal
- D. Writing authentic responses that include the new words

Answer _____

Competency 006—(Reading, Inquiry, and Research): The teacher understands the importance of inquiry and research skills to students' academic success and provides instruction that promotes students' acquisition and effective use of these skills in the content areas.

9. Which of the following actions best represents the first step in the process students should use to interpret graphs and charts containing numerical information?

- A. Looking at the title, axes, headings, and legends to develop a sense of the content of the graph or chart
- B. Analyzing whether the type of graph or chart used is the best method of presenting the information given
- C. Determining the largest and smallest values represented on the graph or chart to get an impression of the data
- D. Comparing and contrasting the various areas of the graph or chart to determine high and low points of the data

Answer _____

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

10. Third-grade students are assigned to write about their city after reading various texts about it. Which of the following types of writing will best allow the students to include academic vocabulary they learned from the reading?

- A. Rhyming poetry
- B. Autobiography
- C. Expository essay

D. Fictional story

Answer _____

11. A teacher works with third-grade students to teach them the steps of the writing process. Currently, the students are writing sentences and paragraphs. Which THREE of the following steps of the writing process remain for the students to complete?

- A. Sharing or displaying the finished product
- B. Taking out or adding words or sentences
- C. Rewriting text to correct any mechanical errors
- D. Brainstorming ideas on a topic

Answer _____

Competency 009—(Viewing and Representing): The teacher understands skills for interpreting, analyzing, evaluating, and producing visual images and messages in various types of media, including electronic media, and provides students with opportunities to develop skills in this area.

12. During a back-to-school night, an elementary teacher discusses the use of media in the classroom and at home. Which of the following suggestions is best for the teacher to make to parents regarding students' television viewing and Internet use at home?

- A. Viewing media with their children and discussing what they see and hear
- B. Preventing children from having any media exposure at home, since most of it will be of little academic value to children
- C. Trusting children to make their own choices about media but asking them to discuss these choices with the parents
- D. Requiring children to watch certain educational programs recommended by the teacher before they watch any other programs

Answer _____

13. A first-grade class studies animals and categorizes them as either sea animals, pets, zoo animals, or farm animals. The teacher wants students to create a visual to display their categories. Which of the following will best display the information?

- A. A flow chart
- B. A concept map
- C. A line graph
- D. A bar graph

Answer _____

Competency 010—(Assessment of Developing Literacy): The teacher understands the basic principles of literacy assessment and uses a variety of assessments to guide literacy instruction.

14. Which of the following assignments best assesses students' use of quotation marks in writing?

- A. A journal entry describing the outcome of a science experiment

- B. A compare and contrast essay about two battles reviewed in social studies class
- C. A persuasive letter to the school board about the school dress code
- D. A personal narrative about a time that students disagreed with a friend

Answer _____

15. A fourth-grade teacher wants to help students become more aware of their literacy development and better monitor their progress in reading and writing. To best help students track their own development, the teacher should have students

- A. write as many grade-level vocabulary words by memory as they can within five minutes.
- B. complete a daily journal entry reflecting on what they have learned that day.
- C. set specific and individual goals regarding improvements they want to make.
- D. work with a partner to complete weekly running records.

Answer _____

Clustered Questions

Use the information below to answer questions 16 and 17.

A first-grade teacher plans to use the following passage from a nonfiction text as the introduction for a series of literacy lessons about tigers. As part of the unit, students will use the nonfiction excerpt and other research to create their own stories about a tiger.

Passage

The tiger is a large cat found in Asia and parts of Russia. Most tigers are black, white and orange, although some are only white and black. They can run at speeds of 35 miles per hour, even though they are the largest species of cat.

Tigers can weigh 400–675 pounds, and their bodies can be up to nine feet long. Is your body as long as a tiger? Tigers are endangered in the wild, because people often destroy their forest homes. In the United States, tigers can be seen in zoos and wildlife preserves. Have you ever seen a tiger?

The following is the fictional story written by Jack.

Sammy the baby tiger lives at a zoo in Texas.
He like to play with his toy ball.
He also like to play with his bruther and sistur.

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

16. Which of the following text elements is most appropriate for the teacher to introduce in preparation for the writing assignment?

- A. Inclusion of illustrations
- B. Plot development
- C. Incorporation of facts
- D. Conflict resolution

Answer _____

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

17. Which of the following comments from the teacher best addresses the strengths and weaknesses of Jack's writing?

- A. You need to add an illustration to help the reader picture what the tiger cub is doing.
- B. You did a great job using punctuation at the end of each sentence to organize your thoughts.
- C. Have you considered using a dictionary to help you identify misspelled words?
- D. Have you considered adding more details to describe the tiger cub to complement the complete sentences you created?

Answer _____

Preparation Manual

Section 4: Sample Selected-Response Answers and Rationales Core Subjects EC–6 Subject Exam I—English Language Arts and Reading (901)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how a competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam I Sample Questions

Competency 001—(Oral Language): The teacher understands the importance of oral language, knows the developmental processes of oral language, and provides students with varied opportunities to develop listening and speaking skills.

1. A fourth-grade teacher notices several students who are shy and reluctant to speak in class. What strategy would be most effective in motivating students' participation in class while enhancing their listening and speaking skills?

- A. Allowing students regular opportunities to read aloud in front of the class
- B. Giving students opportunities to share and listen to stories in a small-group setting
- C. Encouraging students to orally respond to higher-level thinking questions during class
- D. Permitting students to choose which groups of students they feel comfortable speaking to

Answer

Option B is correct because telling personal stories, listening to others' stories, and providing feedback and questions help build students' linguistic fluency, meaningful oral expression, confidence, receptive language skills, and listening comprehension skills. In addition, being in a small-group setting will put the students more at ease.

Option A is incorrect because some students may feel frustrated or embarrassed about their limited speaking and reading abilities and will be too intimidated to participate. **Option C is incorrect** because some students may fear being ridiculed by others because of their limited speaking abilities or incorrect responses to questioning.

Option D is incorrect because students should experience speaking in front of others who are not necessarily part of their preferred peer groups.

2. A fifth-grade teacher includes a read-aloud as part of the language arts block. Which of the following steps would be most appropriate for the teacher to take to help develop students' oral language skills and support students' comprehension of the read-aloud texts?

- A. Grouping students by reading level to complete differentiated activities related to the read-aloud texts
- B. Giving students multiple-choice questions about the main ideas and key details of the read-aloud texts
- C. Providing students with opportunities to use a think-pair-share strategy to discuss the read-aloud texts

D. Determining students' language development levels before choosing the read-aloud texts

Answer

Option C is correct because engaging students in meaningful discourse about the text will develop their oral language skills as well as support their comprehension skills. **Option A is incorrect** because assigning various activities to students in homogenous groups will only support their current level of oral language skills. **Option B is incorrect** because this strategy targets textual elements that would support reading comprehension but does not allow for the development of oral language. **Option D is incorrect** because choosing an appropriate read-aloud text based on students' language development levels supports their reading comprehension but not their oral language skills.

3. A fourth-grade teacher has students write about a specific topic from the current social studies unit and discuss their written response with a group of classmates. The primary purpose for this type of activity is to develop the students'

- A. short-term memory.
- B. oral language skills.
- C. writing skills.
- D. comprehension.

Answer

Option B is correct because this activity prompts the students to discuss social studies topics orally which promotes their oral language skill development. **Option A is incorrect** because discussing a social studies topic that the students have already written about would support their long-term memory rather than their short-term memory. **Option C is incorrect** because the students are not discussing their writing skills; they are discussing the content of their written responses. **Option D is incorrect** because the activity focuses on discussing the students' written responses and the students' ability to synthesize the information. This activity would not measure comprehension at the depth-level required for the teacher to determine mastery.

Competency 003—(Reading Fluency): The teacher understands the importance of fluency for reading comprehension and provides many opportunities for students to improve their reading fluency.

4. Which of the following silent reading practices provides the best conditions for students' individual reading improvement?

- A. Engaging in sustained silent reading for an hour once a week while the teacher reads a book to model engaged reading behaviors
- B. Dropping everything and reading several times a week for 30 minutes while the teacher grades papers or prepares instructional materials
- C. Reading silently any time independent work has been completed early while the teacher keeps anecdotal records of student behaviors
- D. Participating in scaffolded silent reading for 20 minutes every day while the teacher confers with students individually about their reading

Answer

Option D is correct because students are receiving support through scaffolding. This could be in the form of mini-lessons, conferencing, dialogue journaling or other supports. **Option A is incorrect** because participating in sustained silent reading for an hour a week is not optimal. Furthermore, when the teacher provides little direction

to the students in terms of reading material, there is no way to guarantee student success and participation.

Option B is incorrect because there is no student accountability in this situation. The teacher may or may not model good reading behaviors, and the students are not expected to do anything but read. There is no way for the teacher to know if students are actually reading or just pretending. **Option C is incorrect** because while this is a good use of time if students finish early, it does not guarantee that every student will have the opportunity to read. Silent reading cannot be assigned haphazardly in school.

Competency 004—(Reading Comprehension and Applications): The teacher understands the importance of reading for understanding, knows the components and processes of reading comprehension, and teaches students strategies for improving their comprehension, including using a variety of texts and contexts.

5. During a unit on propaganda, a sixth-grade teacher asks students to evaluate short statements made in advertising materials and to attempt to detect any faulty reasoning. Which of the following levels of reading comprehension is primarily being targeted in the lesson?

- A. Literal
- B. Inferential
- C. Evaluative
- D. Appreciative

Answer

Option C is correct because evaluative comprehension includes the skill of detecting faulty reasoning. Students must apply what they have read to their own lives and knowledge of the world to make judgments about text.

Option A is incorrect because literal comprehension requires students to understand plot elements and details about the text. **Option B is incorrect** because inferential comprehension requires students to read between the lines of the text to make inferences about cause and effect, moral lessons, and themes and to predict what may happen next. **Option D is incorrect** because appreciative comprehension requires students to develop their own feelings and opinions about a piece of text.

6. Fifth-grade students are preparing to read a short story about two children's visit to a New York City zoo. Which of the following activities is the best way to introduce the text to promote reading comprehension?

- A. Completing a KWL chart
- B. Listening to the story on audio
- C. Writing about their own experiences in New York City
- D. Identifying New York City on a map

Answer

Option A is correct because having students complete a KWL chart before and after reading the text helps build and activate background knowledge, which promotes reading comprehension. **Option B is incorrect** because while listening to a story on tape may help increase reading fluency, it does not tap into the students' schema to activate the necessary background knowledge needed to assist with reading comprehension. **Option C is incorrect** because many of the students may have not gone to New York City. **Option D is incorrect** because merely identifying the city on the map does nothing to build or activate prior or new knowledge, which is critical to reading comprehension.

Competency 005—(Vocabulary Development): The teacher knows the importance of vocabulary development and applies that knowledge to teach reading, listening, speaking, and writing.

7. When selecting vocabulary from magazine or newspaper articles used in instruction, which of the following methods is most effective?

- A. Selecting vocabulary based on the teacher's experience from previous years of instruction
- B. Asking students to identify words for further study when they read an article for the first time
- C. Using newspapers and magazines specifically made for school use, with bolded vocabulary terms
- D. Cross-referencing articles taught in class with district vocabulary lists to identify key words

Answer

Option B is correct because student selection of words for further study is the best way to ensure that the class is studying words that students will find useful and memorable. **Option A is incorrect** because the teacher may not select the best words based on hypothesis. As a teacher, one can determine some of the words students will struggle with, but there may be more common words that students do not understand. These are more important to study because they occur in written and spoken language more frequently. **Option C is incorrect** because it is not practical to only use magazines and newspapers created for school use. They can be expensive. Furthermore, truly authentic reading can be found in regular magazines and newspapers. **Option D is incorrect** because articles should not be selected simply because of their vocabulary. This process does not lend itself to selecting thought-provoking material that applies to whatever else is being studied in class. Rather, it requires the teacher to find sets of prescribed words regardless of the article's content.

8. As part of a unit in which students explore the most significant scientific discoveries in the last hundred years, a fifth-grade teacher wants to include activities that expand students' understanding of new vocabulary learned in the unit. Which of the following activities would likely be most effective for this purpose?

- A. Sorting newly learned words into labeled categories
- B. Working with a peer to memorize word meanings
- C. Recording definitions of unknown words in a journal
- D. Writing authentic responses that include the new words

Answer

Option D is correct because this approach allows students to use new vocabulary words to reflect upon relevant scientific content and enhances their ability to use the new words in context. **Option A is incorrect** because sorting newly learned vocabulary words into categories does not expand students' understanding of the words in scientific contexts. **Option B is incorrect** because memorizing word meanings does not allow students to understand the words' proper application within a scientific context. **Option C is incorrect** because recording definitions of unknown words in a journal does not provide students with an applicable context in which to use the new vocabulary words, and it limits their understanding to the definition level only.

Competency 006—(Reading, Inquiry, and Research): The teacher understands the importance of inquiry and research skills to students' academic success and provides instruction that promotes students' acquisition and effective use of these skills in the content areas.

9. Which of the following actions best represents the first step in the process students should use to interpret graphs and charts containing numerical information?

- A. Looking at the title, axes, headings, and legends to develop a sense of the content of the graph or chart
- B. Analyzing whether the type of graph or chart used is the best method of presenting the information given

- C. Determining the largest and smallest values represented on the graph or chart to get an impression of the data
- D. Comparing and contrasting the various areas of the graph or chart to determine high and low points of the data

Answer

Option A is correct because this is the previewing phase. Before analyzing any of the numerical data, students must be familiar with the content of the graph or chart. **Option B is incorrect** because this skill requires students to make a judgment about the graph or chart in question. Students cannot adequately do this until they have thoroughly analyzed the graphic. **Option C is incorrect** because before delving into the numbers represented by the graph or chart, students must understand the data being presented. **Option D is incorrect** because analyzing the numbers presented in the graph goes hand in hand with the option presented in choice C. Students cannot be expected to look at numbers in-depth until they understand the overall content of the graph or chart.

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

10. Third-grade students are assigned to write about their city after reading various texts about it. Which of the following types of writing will best allow the students to include academic vocabulary they learned from the reading?

- A. Rhyming poetry
- B. Autobiography
- C. Expository essay
- D. Fictional story

Answer

Option C is correct because the expository essay is the only writing example given that is not creative in nature. It is nonfiction that easily lends itself to the inclusion of academic vocabulary words. **Option A is incorrect** because rhyming poetry already includes restraints because of the rhyme scheme. It is difficult to incorporate given vocabulary words into this framework. **Option B is incorrect** because an autobiography is a retelling of something that happened in a student's life. It may be forced or difficult to integrate the required vocabulary words. **Option D is incorrect** because a fictional story would not lend itself to the inclusion of the assigned vocabulary words.

11. A teacher works with third-grade students to teach them the steps of the writing process. Currently, the students are writing sentences and paragraphs. Which THREE of the following steps of the writing process remain for the students to complete?

- A. Sharing or displaying the finished product
- B. Taking out or adding words or sentences
- C. Rewriting text to correct any mechanical errors
- D. Brainstorming ideas on a topic

Answer

Options A, B and C are correct because these steps of the writing process all take place after a draft of writing is completed. **Option D is incorrect** because this step of the writing process takes place before writing sentences and paragraphs.

Competency 009—(Viewing and Representing): The teacher understands skills for interpreting, analyzing, evaluating, and producing visual images and messages in various types of media, including electronic media, and provides students with opportunities to develop skills in this area.

12. During a back-to-school night, an elementary teacher discusses the use of media in the classroom and at home. Which of the following suggestions is best for the teacher to make to parents regarding students' television viewing and Internet use at home?

- A. Viewing media with their children and discussing what they see and hear
- B. Preventing children from having any media exposure at home, since most of it will be of little academic value to children
- C. Trusting children to make their own choices about media but asking them to discuss these choices with the parents
- D. Requiring children to watch certain educational programs recommended by the teacher before they watch any other programs

Answer

Option A is correct because in this way, parents are helping their children develop their media literacy skills instead of merely dictating what children may or may not watch or listen to. **Option B is incorrect** because preventing children from exposure to any media will not teach children the skills that they need, nor is it realistic. **Option C is incorrect** because this represents too much freedom for most children. Furthermore, the older children get, the less likely they are to discuss what they view and hear with their parents, and this can lead to problematic behavior or ideas. **Option D is incorrect** because the media consumed at home should not be dictated by a teacher or anyone outside of the home. Families need to make decisions about media consumption for themselves.

13. A first-grade class studies animals and categorizes them as either sea animals, pets, zoo animals, or farm animals. The teacher wants students to create a visual to display their categories. Which of the following will best display the information?

- A. A flow chart
- B. A concept map
- C. A line graph
- D. A bar graph

Answer

Option B is correct because a concept map will allow students to categorize the animals more easily. **Option A is incorrect** because a flow chart is designed more to show the connection of ideas or a sequence of events. **Option C is incorrect** because a line graph would not be appropriate to display classifications or categories. **Option D is incorrect** because a bar graph would not be appropriate to display classifications or categories.

Competency 010—(Assessment of Developing Literacy): The teacher understands the basic principles of literacy assessment and uses a variety of assessments to guide literacy instruction.

14. Which of the following assignments best assesses students' use of quotation marks in writing?

- A. A journal entry describing the outcome of a science experiment
- B. A compare and contrast essay about two battles reviewed in social studies class

- C. A persuasive letter to the school board about the school dress code
- D. A personal narrative about a time that students disagreed with a friend

Answer

Option D is correct because this assignment lends itself to the use of dialogue, and therefore to the use of quotation marks. **Option A is incorrect** because this is an expository type of writing in which students must explain the steps they took and the outcome in a science lab. There is no need for quotation marks in this assignment. **Option B is incorrect** because students are listing facts about two battles and stating their similarities and differences. This does not require students to use quoted material, because this type of writing includes common knowledge that is available in any source. **Option C is incorrect** because there is no quoting necessary in this type of assignment. Students are giving their opinion, supported with various rationales from their own experience.

15. A fourth-grade teacher wants to help students become more aware of their literacy development and better monitor their progress in reading and writing. To best help students track their own development, the teacher should have students

- A. write as many grade-level vocabulary words by memory as they can within five minutes.
- B. complete a daily journal entry reflecting on what they have learned that day.
- C. set specific and individual goals regarding improvements they want to make.
- D. work with a partner to complete weekly running records.

Answer

Option C is correct because setting specific and individual goals will help students become more invested in their own learning and will provide them with a way to hold themselves accountable. **Option A is incorrect** because recording vocabulary words in a set period of time does not address literacy development, nor does it involve the students in their learning. **Option B is incorrect** because although a daily journal entry would help students reflect on what they have learned in a day, it does not allow them to keep track of their own learning. **Option D is incorrect** because a running record assesses decoding strategies only and requires detailed training to effectively utilize.

Clustered Questions

Use the information below to answer questions 16 and 17.

A first-grade teacher plans to use the following passage from a nonfiction text as the introduction for a series of literacy lessons about tigers. As part of the unit, students will use the nonfiction excerpt and other research to create their own stories about a tiger.

Passage

The tiger is a large cat found in Asia and parts of Russia. Most tigers are black, white and orange, although some are only white and black. They can run at speeds of 35 miles per hour, even though they are the largest species of cat.

Tigers can weigh 400–675 pounds, and their bodies can be up to nine feet long. Is your body as long as a tiger? Tigers are endangered in the wild, because people often destroy their forest homes. In the United States, tigers can be seen in zoos and wildlife preserves. Have you ever seen a tiger?

The following is the fictional story written by Jack.

Sammy the baby tiger lives at a zoo in Texas.
He like to play with his toy ball.
He also like to play with his bruther and sistur.

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

16. Which of the following text elements is most appropriate for the teacher to introduce in preparation for the writing assignment?

- A. Inclusion of illustrations
- B. Plot development
- C. Incorporation of facts
- D. Conflict resolution

Answer

Option B is correct because plot development is a characteristic of fiction text. **Option A is incorrect** because both fiction and nonfiction texts can have illustrations. **Option C is incorrect** because both fiction and nonfiction texts can include facts. **Option D is incorrect** because both nonfiction and fiction can have conflicts with resolutions. In addition, this text element would be inappropriate as a focus for this grade level.

Competency 008—(Written Communication): The teacher understands that writing to communicate is a developmental process and provides instruction that promotes students' competence in written communication.

17. Which of the following comments from the teacher best addresses the strengths and weaknesses of Jack's writing?

- A. You need to add an illustration to help the reader picture what the tiger cub is doing.
- B. You did a great job using punctuation at the end of each sentence to organize your thoughts.
- C. Have you considered using a dictionary to help you identify misspelled words?
- D. Have you considered adding more details to describe the tiger cub to complement the complete sentences you created?

Answer

Option D is correct because it addresses the strengths and needs of Jack's writing. **Option A is incorrect** because it only focuses on a need. **Option B is incorrect** because it only focuses on a strength. **Option C is incorrect** because it only focuses on a need.

Preparation Manual

Section 5: Sample Selected-Response Questions Core Subjects EC–6 Subject Exam II—Mathematics (902)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam II Sample Questions

Competency 001—(Mathematics Instruction): The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize and implement instruction and assess learning.

1. Students are working independently to solve the equation $-4 + ? = -10$. The teacher says the following to help them understand the problem.

"If you owe somebody \$4, you have a negative \$4 balance with that person. If you borrow more money from the person, you will owe more and have a more negative balance with that person."

After speaking with several students, the teacher finds that some of them are still having trouble with the concept of negative numbers. As a result, the teacher then reteaches the concept using a number line. Which of the following types of assessments has the teacher used?

- A. Formative
- B. Summative
- C. Formal
- D. Criterion

Answer _____

2. A fifth-grade teacher writes the problem 56×12 on the board. Students begin to solve the problem mentally, and as each student finds a solution, he or she signals the teacher with a thumbs-up signal. When almost every student has given a thumbs-up signal, the teacher has the following dialogue with a student.

Teacher: "Billy, what answer did you come up with?"

Billy: "672."

Teacher: "Great job, Billy! That is the correct answer. Raise your hand if you found 672 to be the product, like Billy."

Almost every student in the class raised a hand. The teacher writes the next problem on the board.

Which of the following instructional adjustments can the teacher make to best assess all of the students' understanding of multiplying two-digit numbers?

- A. Allowing students to write their answers on paper, then collecting the papers at the end of the lesson
- B. Asking multiple students to share and defend their solutions before acknowledging the correct answer
- C. Asking students who did not hold up their thumbs to share their answer and explain
- D. Having Billy work the problem out on the board in front of the class

Answer _____

3. Which of the following learning goals is most appropriate for a third-grade unit on money?

- A. Students will be able to determine the value of a collection of coins and bills.
- B. Students will be able to represent the value of a collection of coins as a fraction of a dollar.
- C. Students will be able to differentiate between money received as income and money received as gifts.
- D. Students will be able to solve problems involving money by performing operations on decimals to the hundredths place.

Answer _____

4. Which of the following activities is most effective in helping kindergarten students understand measurement of the lengths of small objects, such as pencils or cups?

- A. Placing interlocking cubes next to the objects and counting the cubes.
- B. Cutting sheets of construction paper so that they are the same dimensions as the objects.
- C. Listening to the teacher explain how to line up a ruler next to the objects and mark their lengths.
- D. Watching the teacher demonstrate how to estimate the lengths of the objects using a child's hand or shoe.

Answer _____

Competency 002—(Number Concepts and Operations): The teacher understands concepts related to numbers, operations and algorithms and the properties of numbers.

Word problem: Samantha's Bakery sells cupcakes in packages of 12 and cookies in packages of 20. The bakery sold the same number of cupcakes and cookies yesterday. What is the minimum number of cupcakes that the bakery could have sold?

5. A teacher creates the word problem shown for a math lesson. Based on the word problem, the lesson will most likely cover which of the following mathematics concepts?

- A. Least common factor
- B. Greatest common factor
- C. Least common multiple
- D. Greatest common multiple

Answer _____

6. Celeste is buying erasers for 8 of her friends. There are 76 erasers left at the store. Which of the following approaches can Celeste use to determine the greatest number of erasers she can buy to give each of her friends the same number and have none remaining?

- A. Drawing a picture of 76 erasers and circling groups of 8 before counting the number of groups created
- B. Creating a table in which one column represents the number of erasers at the store and the other represents the number of erasers each friend receives
- C. Using a standard algorithm learned previously in class to solve 76 divided by 8
- D. Making an organized list of the multiples of 8 to see which one is closest to 76

Answer _____

7. A first-grade teacher has set up the following math workstations for students to work in pairs.

- Station 1: Students toss 7 two-color counters from a cup and record the addition equation represented. They repeat the process ten times.
- Station 2: Each student builds a tower of 8 cubes using two different colors, and then records the addition equation that the colors represent. Students then exchange towers and record the addition equation for the new towers.
- Station 3: Students are provided with 9 counters each. One student hides some of the counters. The other student looks at how many counters remain present and determines how many are hidden. The students then record the equation that the missing counters represent.

Which of the following relationships are the students most likely exploring in the stations?

- A. Spatial concepts
- B. One more and one less
- C. Benchmarking numbers
- D. Part-part-whole

Answer _____

Competency 003—(Patterns and Algebra): The teacher understands concepts related to patterns, relations, functions and algebraic reasoning.

| | | | | | |
|-------------|------------|-----------|-----------|-----------|-----------|
| Time | 12:05 A.M. | 2:05 A.M. | 4:05 A.M. | 5:05 A.M. | 6:05 A.M. |
| Temperature | 67 | 60 | 53 | 49.5 | 46 |

8. A cold front arrived at 12:05 A.M., and the subsequent temperatures were recorded in the table shown. If x represents the number of hours after 12:05 A.M., which of the following equations best represents the change in temperature as a function of time?

- A. $y = 3.5x + 67$
- B. $y = -7.1x + 67$
- C. $y = -7.1x - 67$
- D. $y = -3.5x + 67$

Answer _____

Competency 004—(Geometry and Measurement): The teacher understands concepts and principles of geometry and measurement.

9. Which of the following geometric solids has five faces, eight edges and five vertices?

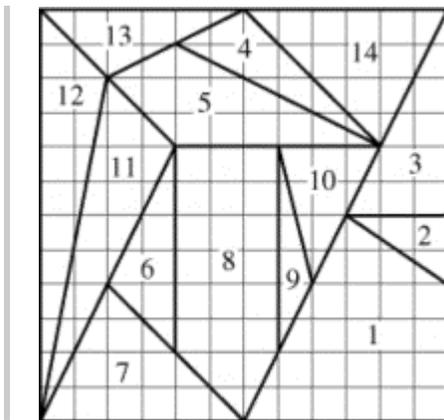
- A. A pentagonal pyramid
- B. A rectangular pyramid
- C. An octagonal prism
- D. A triangular prism

Answer _____

10. Which of the following statements best explains why the algebraic formula for the area of a triangle is $\frac{1}{2}bh$?

- A. A parallelogram can be transformed into a rectangle if a triangular piece is moved from one side to the other.
- B. The height of a triangle is not equal to the length of one of its sides, and the length must be divided by 2 to be used to find the area of the triangle.
- C. A parallelogram is composed of two congruent triangles, so the area of a parallelogram with the same base and height as the triangle can be divided by 2 to find the area of the triangle.
- D. This formula is only true for scalene triangles because all of their sides are different lengths, so one has to use the base and height to find the area.

Answer _____



11. Archimedes' Stomachion puzzle from about 200 B.C. in which a 12-by-12 grid is divided into 12 different polygons, is shown above. A third-grade teacher is using the puzzle to determine whether or not students are able to partition or decompose nonstandard polygons to find their areas. Of which of the following polygons should the students be asked to find the area in order to demonstrate this skill?

Select all that apply.

- A. Figure 1
- B. Figure 3
- C. Figure 5

- D. Figure 8
- E. Figure 12

Answer _____

Competency 005—(Probability and Statistics): The teacher understands concepts related to probability and statistics and their applications.

12. After learning the theoretical probability of a two-sided coin landing on any one side, students work in groups to flip the coin several times and get the following results: 9 heads and 6 tails. Based on the scenario, which of the following observations made by students about probability is accurate?

- A. The theoretical probability of a coin's landing on heads, 0.5, is equal to the experimental probability obtained.
- B. The theoretical probability of a coin's landing on heads is less than the experimental probability obtained.
- C. The experimental probability of a coin's landing on heads, 0.6, is lower than expected.
- D. The experimental probability would have been more accurate if the students had decreased the number of trials.

Answer _____

Competency 006—(Mathematical Processes): The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems and make mathematical connections within and outside of mathematics.

| | |
|--|--------------------------|
| | $3 \times (2 + 6)^2 - 4$ |
| | $[3(2) + 3(6)]^2 - 4$ |
| | $(24)^2 - 4$ |
| | $576 - 4$ |
| | 572 |

13. A student simplifies the initial expression by applying the rule of order of operations. Which of the following best describes the student's error when simplifying the expression?

- A. The student added before evaluating the power of the exponents.
- B. The student evaluated the exponent before subtracting.
- C. The student multiplied before simplifying within grouping symbols.
- D. The student simplified the expression from left to right.

Answer _____

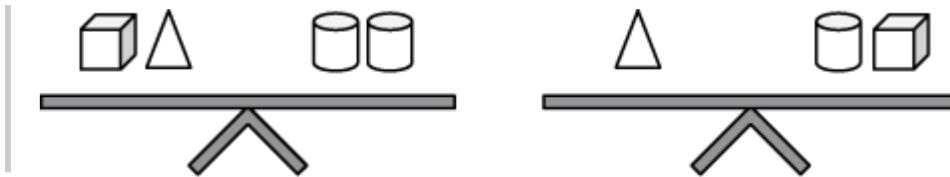
Word problem: A paint store is having a sale, and for every gallon of paint a customer purchases, the customer will receive one additional gallon for free. Write an equation for p , the number of gallons of paint received, in terms of x , the number of gallons of paint purchased.

14. A teacher asks students to solve the word problem shown. One student, John, says the answer is $2 + x = p$.

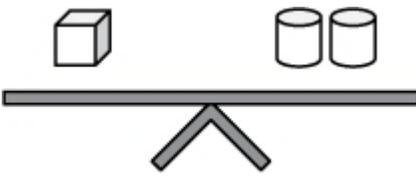
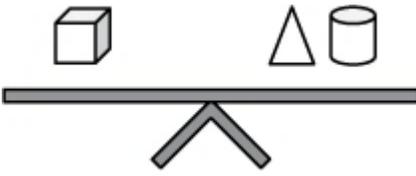
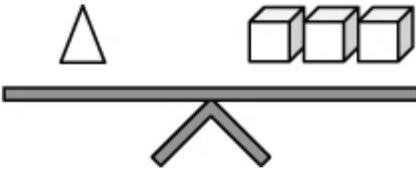
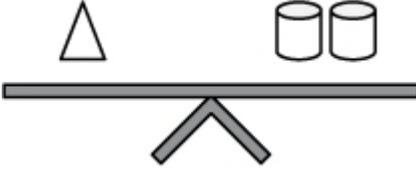
Which of the following activities will best help John recognize his misconception?

- A. Generating a model
- B. Creating a function table
- C. Using mental math
- D. Graphing the numbers

Answer _____



15. In both figures shown, the scales are balanced. Which of the following scales is also balanced?

- A. 
- B. 
- C. 
- D. 

Answer _____

Preparation Manual

Section 5: Sample Selected-Response Answers and Rationales Core Subjects EC–6 Subject Exam II—Mathematics (902)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam II Sample Questions

Competency 001—(Mathematics Instruction): The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize and implement instruction and assess learning.

1. Students are working independently to solve the equation $-4 + ? = -10$. The teacher says the following to help them understand the problem.

"If you owe somebody \$4, you have a negative \$4 balance with that person. If you borrow more money from the person, you will owe more and have a more negative balance with that person."

After speaking with several students, the teacher finds that some of them are still having trouble with the concept of negative numbers. As a result, the teacher then reteaches the concept using a number line. Which of the following types of assessments has the teacher used?

- A. Formative
- B. Summative
- C. Formal
- D. Criterion

Answer

Option A is correct because formative assessment involves teachers' adjusting their instruction based on their assessment of students. The teacher in the scenario has conversations with the students and teaches again based on what is observed. **Option B is incorrect** because a summative assessment involves a teacher evaluating a student's learning, often at the end of a unit. It is usually a high-stakes test. **Option C is incorrect** because a formal assessment will give a teacher data. It is usually a test that has been used before, and data can be compared between students. **Option D is incorrect** because most criterion-referenced tests are used to simply tell if a student has learned the material, not to adjust instruction as described in the scenario.

2. A fifth-grade teacher writes the problem 56×12 on the board. Students begin to solve the problem mentally, and as each student finds a solution, he or she signals the teacher with a thumbs-up signal. When almost every student has given a thumbs-up signal, the teacher has the following dialogue with a student.

Teacher: "Billy, what answer did you come up with?"

Billy: "672."

Teacher: "Great job, Billy! That is the correct answer. Raise your hand if you found 672 to be the product, like Billy."

Almost every student in the class raised a hand. The teacher writes the next problem on the board.

Which of the following instructional adjustments can the teacher make to best assess all of the students' understanding of multiplying two-digit numbers?

- A. Allowing students to write their answers on paper, then collecting the papers at the end of the lesson
- B. Asking multiple students to share and defend their solutions before acknowledging the correct answer
- C. Asking students who did not hold up their thumbs to share their answer and explain
- D. Having Billy work the problem out on the board in front of the class

Answer

Option B is correct because the discussion gives the teacher an opportunity to hear how students are solving the problem. It will also give students an opportunity to share before they know their answer is wrong. **Option A is incorrect** because the students are only turning in their answers, not their work or their thinking. It will not show the teacher the level of their understanding. **Option C is incorrect** because it is only focusing on the students who did not raise their hand. More students may have missed the problem but were too shy to admit it. **Option D is incorrect** because the teacher is learning only about Billy's level of understanding, not that of the rest of the class.

3. Which of the following learning goals is most appropriate for a third-grade unit on money?

- A. Students will be able to determine the value of a collection of coins and bills.
- B. Students will be able to represent the value of a collection of coins as a fraction of a dollar.
- C. Students will be able to differentiate between money received as income and money received as gifts.
- D. Students will be able to solve problems involving money by performing operations on decimals to the hundredths place.

Answer

Option A is correct because this option correctly describes a Texas Essential Knowledge and Skill (TEK) for third grade math. A learning goal identifies what students will learn or be able to do as a result of instruction, not what they will be asked to do to demonstrate such learning. **Options B, C and D are incorrect** because they do not describe a learning goal that is appropriate for third grade.

4. Which of the following activities is most effective in helping kindergarten students understand measurement of the lengths of small objects, such as pencils or cups?

- A. Placing interlocking cubes next to the objects and counting the cubes.
- B. Cutting sheets of construction paper so that they are the same dimensions as the objects.
- C. Listening to the teacher explain how to line up a ruler next to the objects and mark their lengths.
- D. Watching the teacher demonstrate how to estimate the lengths of the objects using a child's hand or shoe.

Answer

Option A is correct because having the students count the number of interlocking cubes and placing the cubes next to each item provides a visual for the student to use in determining length. **Option B is incorrect** because cutting the construction paper would help in developing the concept of area and not length. **Option C is incorrect** because effectively measuring with a ruler involves concepts that have not been introduced yet in kindergarten. **Option D is incorrect** because using a hand or a shoe to estimate a length is more appropriate when the order of magnitude of the objects to measure is greater.

Competency 002—(Number Concepts and Operations): The teacher understands concepts related to numbers, operations and algorithms and the properties of numbers.

Word problem: Samantha's Bakery sells cupcakes in packages of 12 and cookies in packages of 20. The bakery sold the same number of cupcakes and cookies yesterday. What is the minimum number of cupcakes that the bakery could have sold?

5. A teacher creates the word problem shown for a math lesson. Based on the word problem, the lesson will most likely cover which of the following mathematics concepts?

- A. Least common factor
- B. Greatest common factor
- C. Least common multiple
- D. Greatest common multiple

Answer

Option C is correct because finding the least common multiple will identify the smallest number of cupcakes sold. In fact, let x be the number of packages of cupcakes that were sold and y be the number of packages of cookies that were sold. The number of sold cupcakes will be $12x$, and the number of sold cookies will be $20y$. Clearly 12 divides $12x$ and 20 divides $20y$. Since $12x = 20y$, 20 must also divide $12x$. Since 12 and 20 both divide $12x$, $12x$ is a common multiple of 12 and 20. The problem asks for the minimum (or least) number of cupcakes that could have been sold, so the least common multiple must be found to answer the question. **Option A is incorrect** because the least common factor is always 1. **Option B is incorrect** because the greatest common divisor is 4. **Option D is incorrect** because there is no greatest common multiple.

6. Celeste is buying erasers for 8 of her friends. There are 76 erasers left at the store. Which of the following approaches can Celeste use to determine the greatest number of erasers she can buy to give each of her friends the same number and have none remaining?

- A. Drawing a picture of 76 erasers and circling groups of 8 before counting the number of groups created
- B. Creating a table in which one column represents the number of erasers at the store and the other represents the number of erasers each friend receives
- C. Using a standard algorithm learned previously in class to solve 76 divided by 8
- D. Making an organized list of the multiples of 8 to see which one is closest to 76

Answer

Option D is correct because the approach described provides the correct answer of how many erasers Celeste should buy at the store, 72. **Options A, B and C are incorrect** because the approaches described provide the number of erasers each friend will get, i.e., 7, not the total number of erasers Celeste should buy.

7. A first-grade teacher has set up the following math workstations for students to work in pairs.

- Station 1: Students toss 7 two-color counters from a cup and record the addition equation represented. They repeat the process ten times.
- Station 2: Each student builds a tower of 8 cubes using two different colors, and then records the addition equation that the colors represent. Students then exchange towers and record the addition equation for the new towers.
- Station 3: Students are provided with 9 counters each. One student hides some of the counters. The other student looks at how many counters remain present and determines how many are hidden. The students then record the equation that the missing counters represent.

Which of the following relationships are the students most likely exploring in the stations?

- A. Spatial concepts
- B. One more and one less
- C. Benchmarking numbers
- D. Part-part-whole

Answer

Option D is correct because in the activity, the students are conceptualizing that a number is made up of two or more parts. **Option A is incorrect** because in doing addition based on spatial relationships, students recognize the number of objects based on the way they are arranged. **Option B is incorrect** because in one-more-one-less relationships, students add and subtract 1 to a number. **Option C is incorrect** because when students use benchmarks, they relate a number to 5 or 10.

Competency 003—(Patterns and Algebra): The teacher understands concepts related to patterns, relations, functions and algebraic reasoning.

| | | | | | |
|-------------|------------|-----------|-----------|-----------|-----------|
| Time | 12:05 A.M. | 2:05 A.M. | 4:05 A.M. | 5:05 A.M. | 6:05 A.M. |
| Temperature | 67 | 60 | 53 | 49.5 | 46 |

8. A cold front arrived at 12:05 A.M., and the subsequent temperatures were recorded in the table shown. If x represents the number of hours after 12:05 A.M., which of the following equations best represents the change in temperature as a function of time?

- A. $y = 3.5x + 67$
- B. $y = -7.1x + 67$
- C. $y = -7.1x - 67$
- D. $y = -3.5x + 67$

Answer

Option D is correct because the y -intercept represents the starting temperature, which was 67, and the slope represents the rate at which the temperature changed per hour, which was $\frac{60 - 67}{2 - 0} = -3.5$. **Options A and B are incorrect** because the slope is incorrect. **Option C is incorrect** because both slope and y -intercept are incorrect.

Competency 004—(Geometry and Measurement): The teacher understands concepts and principles of geometry and measurement.

9. Which of the following geometric solids has five faces, eight edges and five vertices?

- A. A pentagonal pyramid
- B. A rectangular pyramid
- C. An octagonal prism
- D. A triangular prism

Answer

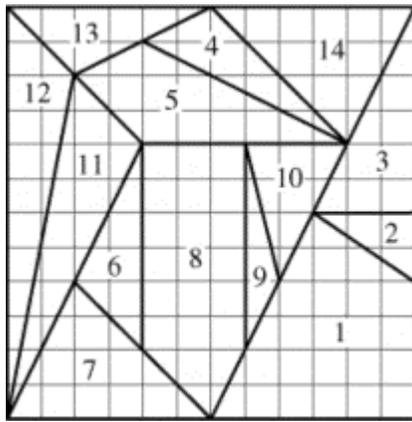
Option B is correct because a rectangular pyramid has one rectangular base and four triangular faces, eight edges and five vertices. **Option A is incorrect** because pentagons have five sides, so a pentagonal pyramid has six faces — one pentagonal base and five triangular faces. **Option C is incorrect** because an octagonal prism has ten faces — two octagonal faces and eight rectangular faces. **Option D is incorrect** because a triangular prism has five faces, nine edges and six vertices.

10. Which of the following statements best explains why the algebraic formula for the area of a triangle is $\frac{1}{2}bh$?

- A. A parallelogram can be transformed into a rectangle if a triangular piece is moved from one side to the other.
- B. The height of a triangle is not equal to the length of one of its sides, and the length must be divided by 2 to be used to find the area of the triangle.
- C. A parallelogram is composed of two congruent triangles, so the area of a parallelogram with the same base and height as the triangle can be divided by 2 to find the area of the triangle.
- D. This formula is only true for scalene triangles because all of their sides are different lengths, so one has to use the base and height to find the area.

Answer

Option C is correct because every parallelogram is made up of two congruent triangles. The formula for the area of a parallelogram is $b \times h$, so the area of each of the two congruent triangles is half the area of the parallelogram. Two congruent triangles can always be arranged to form a parallelogram with the same base and the same height as the triangles. The area of the triangle will therefore be one-half as much as that of the parallelogram. **Option A is incorrect** because while the statement is true, it does not explain the formula for the area of a triangle. **Option B is incorrect** because it is logically faulty. **Option D is incorrect** because the area of every triangle can be found using the formula shown.



11. Archimedes' Stomachion puzzle from about 200 B.C. in which a 12-by-12 grid is divided into 12 different polygons, is shown above. A third-grade teacher is using the puzzle to determine whether or not students are able to partition or decompose nonstandard polygons to find their areas. Of which of the following polygons should the students be asked to find the area in order to demonstrate this skill?

Select all that apply.

- A. Figure 1
- B. Figure 3
- C. Figure 5
- D. Figure 8
- E. Figure 12

Answer

Options A, C and D are correct because Figure 1, Figure 5 and Figure 8 are nonstandard polygons, which are the focus of the lesson. **Options B and E are incorrect** because Figure 3 and Figure 12 are triangles.

Competency 005—(Probability and Statistics): The teacher understands concepts related to probability and statistics and their applications.

12. After learning the theoretical probability of a two-sided coin landing on any one side, students work in groups to flip the coin several times and get the following results: 9 heads and 6 tails. Based on the scenario, which of the following observations made by students about probability is accurate?

- A. The theoretical probability of a coin's landing on heads, 0.5, is equal to the experimental probability obtained.
- B. The theoretical probability of a coin's landing on heads is less than the experimental probability obtained.
- C. The experimental probability of a coin's landing on heads, 0.6, is lower than expected.
- D. The experimental probability would have been more accurate if the students had decreased the number of trials.

Answer

Option B is correct because the experimental probability and the theoretical probability of the coin's landing on heads are respectively 0.6 and 0.5. The theoretical probability is thus less than the experimental probability. **Option A is incorrect** because the experimental probability and the theoretical probability of the coin's landing on

heads are not equal. **Option C is incorrect** because the experimental probability of the coin's landing on heads is greater than the theoretical probability. **Option D is incorrect** because as the number of trials (in this case a trial is flipping a coin) increases, the experimental probability gets closer to the theoretical probability.

Competency 006—(Mathematical Processes): The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems and make mathematical connections within and outside of mathematics.

$$\begin{aligned} & 3 \times (2 + 6)^2 - 4 \\ & [3(2) + 3(6)]^2 - 4 \\ & (24)^2 - 4 \\ & 576 - 4 \\ & 572 \end{aligned}$$

13. A student simplifies the initial expression by applying the rule of order of operations. Which of the following best describes the student's error when simplifying the expression?

- A. The student added before evaluating the power of the exponents.
- B. The student evaluated the exponent before subtracting.
- C. The student multiplied before simplifying within grouping symbols.
- D. The student simplified the expression from left to right.

Answer

Option C is correct because the student multiplied before evaluating within the grouping symbol, violating the rule for order of operations: parentheses left to right, exponents left to right, multiplications or divisions left to right, additions or subtractions left to right. **Option A is incorrect** because the distributive property is not a rule in order of operations. **Option B is incorrect** because if the student had simplified the expression from left to right, the student would have gotten $3 \times 2 = 6$; $6 + 6 = 12$; $12^2 = 144$; $144 - 4 = 140$. **Option D is incorrect** because the student was supposed to add before evaluating the power of the exponent, since addition fell within evaluating the expression in parentheses.

Word problem: A paint store is having a sale, and for every gallon of paint a customer purchases, the customer will receive one additional gallon for free. Write an equation for p , the number of gallons of paint received, in terms of x , the number of gallons of paint purchased.

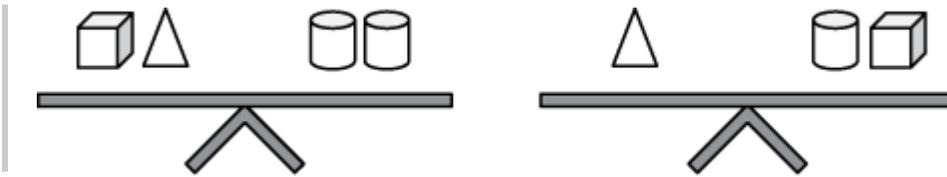
14. A teacher asks students to solve the word problem shown. One student, John, says the answer is $2 + x = p$. Which of the following activities will best help John recognize his misconception?

- A. Generating a model
- B. Creating a function table
- C. Using mental math
- D. Graphing the numbers

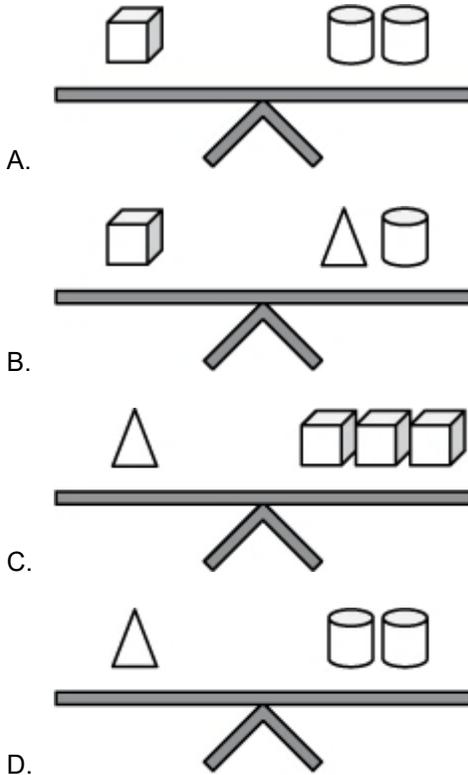
Answer

Option B is correct because a function table is a table of ordered pairs that follow a rule. The table will help the student identify the pattern. **Option A is incorrect** because generating a model is more appropriate for a

geometric figure. **Option C is incorrect** because using mental math is less effective than teaching a student how to accurately use a strategy. **Option D is incorrect** because graphing the numbers is a skill that follows understanding and seeing the pattern and relating it to an expression.



15. In both figures shown, the scales are balanced. Which of the following scales is also balanced?



Answer

Option C is correct because of the following logic steps. Let's call the scale to the left scale 1 and the scale to the right scale 2.

Step 1: In scale 1 substitute a cylinder and a cube in place of the triangle, as per the equality in scale 2.

Step 2: Using the properties of equality, cancel a cylinder from both sides, obtaining a balanced scale, which will be called scale 3, with two cubes on a side and a cylinder on the other.

Step 3: In scale 2 substitute two cubes in place of the cylinder, as per equality in scale 3, obtaining a balanced scale with a triangle on one side and three cubes on the other. The latter balanced scale corresponds to the scale in Option C.

Option A is incorrect because one cylinder balances two cubes, as proved in step 2. If the scale in Option A were balanced, then substituting two cubes for each cylinder would give the scale a cube on one side and four cubes on the other. **Option B is incorrect** because replacing the triangle with a cylinder and a cube (scale 2) would give the scale a cube on one side and a cube and two cylinders on the other. Canceling a cube on each side would result in having two cylinders on one side and nothing on the other. **Option D is incorrect** because it would imply that a cube balances a cylinder. That is not true, as proved in step 2.

Preparation Manual

Section 6: Sample Selected-Response Questions Core Subjects EC–6 Subject Exam III—Social Studies (903)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

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Subject Exam III Sample Questions

Competency 001—(Social Science Instruction): The teacher understands and applies social science knowledge and skills to plan, organize and implement instruction and assess learning.

1. Which of the following is the most appropriate tool for teaching students the geographic concept of hemispheres?
- A. Web-based encyclopedias
 - B. Digital global positioning systems
 - C. Online three-dimensional maps
 - D. Internet travel blogs

Answer _____

Competency 002—(History): The teacher understands and applies knowledge of significant historical events and developments, multiple historical interpretations and ideas and relationships between the past, the present and the future as defined by the Texas Essential Knowledge and Skills (TEKS).

2. Which of the following had the greatest impact on Anglo settlement in Hispanic Texas?
- A. Native Americans encouraged trade with Anglos.
 - B. Mexican land grants provided inexpensive properties in Texas.
 - C. Government payments enticed settlers to inhabit American Indian territory.
 - D. The prospect of religious freedom in Texas attracted Anglo settlement.

Answer _____

3. Which THREE of the following events most directly affected the economic development of Texas in the twentieth century?
- A. The attack on Pearl Harbor in 1941
 - B. The Arab oil embargo of 1973

- C. The oil strike at Spindletop in 1901
- D. The stock market crash of 1929
- E. The Cuban missile crisis of 1962

Answer _____

4. Which of the following was a major long-term effect of the westward expansion of the United States in the 1800s?
- A. The growth of United States agricultural and mineral exports
 - B. An increase in tensions between the United States and Great Britain
 - C. A shift in United States foreign policy toward isolationism
 - D. The establishment of peaceful relationships with American Indian groups

Answer _____

Competency 003—(Geography and Culture): The teacher understands and applies knowledge of geographic relationships involving people, places and environments in Texas, the United States and the world; the teacher also understands and applies knowledge of cultural development, adaptation, diversity and interactions among science, technology and society as defined by the Texas Essential Knowledge and Skills (TEKS).

5. Which of the following statements best describes the continuing role of familial oral storytelling traditions in many cultures around the world?
- A. Stories have become the primary means by which cultures interact with one another in an increasingly globalized world.
 - B. Oral traditions serve as a means of transmitting knowledge of cultural practices and societal norms to others.
 - C. New advances in technology have made oral traditions largely irrelevant in most cultures around the world.
 - D. Religious groups utilize storytelling mainly to discredit the beliefs of other religions and cultural practices.

Answer _____

6. Which of the following events was a result of human interaction with the environment during the Spanish colonial era of Texas history?
- A. The construction of presidios near churches
 - B. The conversion of American Indians to Christianity
 - C. The building of acequias for the missions
 - D. The creation of alcaldes for civil settlements

Answer _____

7. Texas rice farmers depend on water from the Colorado River to irrigate their crops. In times of severe drought, less water is released downstream, which sometimes results in inadequate irrigation and failed crops. To prevent such a loss, rice farmers sometimes plant alternative crops on their lands. This action is an example of
- A. adapting to environmental changes.
 - B. adjusting to supply and demand.

- C. using nonrenewable resources to improve farming.
- D. modifying the environment to meet farming needs.

Answer _____

Competency 004—(Economics): The teacher understands and applies knowledge of economic systems and how people organize economic systems to produce, distribute and consume goods and services.

Use the information below to answer the question that follows.

ANNUAL EMPLOYMENT CHANGE, 1998–2003

| Year | Percent Change in Employment in the United States | Percent Change in Employment in Texas |
|------|---|---------------------------------------|
| 1998 | 2.6% | 3.8% |
| 1999 | 2.4% | 2.4% |
| 2000 | 2.2% | 3.0% |
| 2001 | 0.0% | 0.9% |
| 2002 | -1.1% | -1.0% |
| 2003 | -0.3% | -0.5% |

Source: Texas Comptroller of Public Accounts and IHS Global Insight Inc.

8. Which of the following observations most accurately correlates with the chart above?
- A. Texas outpaced the United States overall in employment growth between 1999 and 2000.
 - B. Texas added significantly more jobs than any other state in 1998.
 - C. The most significant variance in employment change between Texas and the United States overall occurred in 2002.
 - D. Employment growth in all states declined in 2002 compared with the stable growth in 2001.

Answer _____

9. Based on the economic principles of supply and demand, a decrease in the production rates of oil will most likely result in which of the following?

- A. Increased capital investment in the oil industry
- B. Increased wages for oil-field workers
- C. Increased stock of produced oil
- D. Increased oil prices for consumers

Answer _____

Competency 005—(Government and Citizenship): The teacher understands and applies knowledge of concepts of government, democracy and citizenship, including ways that individuals and groups achieve their goals through political systems.

Read the excerpt below and answer the question that follows.

"There is an opinion that parties in free countries are useful checks upon the administration of the government and serve to keep alive the spirit of liberty. This within certain limits is probably true; and in governments of a monarchical cast, patriotism may look with indulgence, if not with favor, upon the spirit of party. But in those of the popular character, in governments purely elective, it is a spirit not to be encouraged. From their natural tendency, it is certain there will always be enough of that spirit for every salutary purpose. And there being constant danger of excess, the effort ought to be by force of public opinion, to mitigate and assuage it. A fire not to be quenched, it demands a uniform vigilance to prevent its bursting into a flame, lest, instead of warming, it should consume."

10. In the excerpt above from his final speech as president, George Washington urged United States citizens to

- A. repay the national debt.
- B. avoid foreign alliances.
- C. limit freedom of speech.
- D. refrain from joining political parties.

Answer _____

11. Which of the following is a responsibility of citizenship?

- A. Running for elected office
- B. Paying federal taxes
- C. Serving in the military
- D. Participating in elections

Answer _____

12. Which of the following was the primary purpose of adding the Bill of Rights to the United States Constitution?

- A. Creating explicit limits on the power of the federal government
- B. Granting the power of judicial review to the Supreme Court
- C. Ceding sovereignty to the individual states
- D. Amending errors in the Constitution

Answer _____

Preparation Manual

Section 6: Sample Selected-Response Answers and Rationales Core Subjects EC–6 Subject Exam III—Social Studies (903)

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Subject Exam III Sample Questions

Competency 001—(Social Science Instruction): The teacher understands and applies social science knowledge and skills to plan, organize and implement instruction and assess learning.

1. Which of the following is the most appropriate tool for teaching students the geographic concept of hemispheres?
- A. Web-based encyclopedias
 - B. Digital global positioning systems
 - C. Online three-dimensional maps
 - D. Internet travel blogs

Answer

Option C is correct because online three-dimensional maps allow students to see Earth from many viewpoints besides traditional flat representations. **Option A is incorrect** because online encyclopedias merely make the textbook's information electronic. **Option B is incorrect** because GPS is better suited to teach latitude and longitude, not hemispheres. **Option D is incorrect** because blogs are not always a valid source of information.

Competency 002—(History): The teacher understands and applies knowledge of significant historical events and developments, multiple historical interpretations and ideas and relationships between the past, the present and the future as defined by the Texas Essential Knowledge and Skills (TEKS).

2. Which of the following had the greatest impact on Anglo settlement in Hispanic Texas?
- A. Native Americans encouraged trade with Anglos.
 - B. Mexican land grants provided inexpensive properties in Texas.
 - C. Government payments enticed settlers to inhabit American Indian territory.
 - D. The prospect of religious freedom in Texas attracted Anglo settlement.

Answer

Option B is correct because the Mexican government approved land grants to encourage Anglos to move to Texas. Anglos could purchase land for much less in Texas than in the United States, which encouraged large

groups of Anglos to move to Texas. **Option A is incorrect** because the Native Americans living in Texas were resistant to Anglos moving onto their lands. **Option C is incorrect** because Mexico did not pay anything to the settlers; the only financial incentive was the land grant. **Option D is incorrect** because settlers had to sign an oath with Mexico stating they would convert to Catholicism upon settling in Texas.

3. Which THREE of the following events most directly affected the economic development of Texas in the twentieth century?

- A. The attack on Pearl Harbor in 1941
- B. The Arab oil embargo of 1973
- C. The oil strike at Spindletop in 1901
- D. The stock market crash of 1929
- E. The Cuban missile crisis of 1962

Answer

Option B is correct because, although the embargo placed on oil products from the Middle East caused distress for the rest of the United States, the oil-producing state of Texas experienced an economic advantage because of price inflation. **Option C is correct** because the discovery of oil at the Spindletop salt dome near Beaumont, Texas in 1901 can be attributed to the birth of the modern petroleum industry in Texas. The oil strike opened new avenues of business for prospectors, oil refineries and manufacturers. **Option D is correct** because, although many Texans were skeptical that the stock market crash of 1929 would have serious effects on their state economy, they began to change their positions on seeking federal aid as conditions during the Great Depression worsened. New Deal programs such as the Civilian Conservation Corps (CCC) and the Works Progress Administration (WPA) benefited the state during its economic downturn by alleviating unemployment issues and building new infrastructure. **Option A is incorrect** because, although the attack on Pearl Harbor came at a cost to the United States military, the economic impact was far less direct to the state of Texas. **Option E is incorrect** because the thirteen-day conflict between the United States, the Soviet Union and Cuba did not have a direct effect on the economy of Texas.

4. Which of the following was a major long-term effect of the westward expansion of the United States in the 1800s?

- A. The growth of United States agricultural and mineral exports
- B. An increase in tensions between the United States and Great Britain
- C. A shift in United States foreign policy toward isolationism
- D. The establishment of peaceful relationships with American Indian groups

Answer

Option A is correct because the acquisition of large tracts of land during United States westward expansion led to an extensive increase in the farming, ranching, and mining industries. The lands of the Midwest attracted farmers, miners, and lumber barons seeking rich natural resources. **Option B is incorrect** because while America's westward expansion led to minimal tension between the United States and Great Britain, it was not long-term compared with the tension that was already present because of earlier conflicts with Great Britain and was not a major effect of westward expansion. **Option C is incorrect** because westward expansion was the result of United States foreign policy shifting away from isolationism. **Option D is incorrect** because American Indians were removed from the land, not assimilated into the culture.

Competency 003—(Geography and Culture): The teacher understands and applies knowledge of geographic relationships involving people, places and environments in Texas, the United States and the world; the teacher also understands and applies knowledge of cultural development, adaptation, diversity and interactions among science, technology and society as defined by the Texas Essential Knowledge and Skills (TEKS).

5. Which of the following statements best describes the continuing role of familial oral storytelling traditions in many cultures around the world?

- A. Stories have become the primary means by which cultures interact with one another in an increasingly globalized world.
- B. Oral traditions serve as a means of transmitting knowledge of cultural practices and societal norms to others.
- C. New advances in technology have made oral traditions largely irrelevant in most cultures around the world.
- D. Religious groups utilize storytelling mainly to discredit the beliefs of other religions and cultural practices.

Answer

Option B is correct because the family unit uses storytelling to transmit knowledge of the culture and society in which it exists. **Option A is incorrect** because there are many means by which cultures interact, and storytelling is only a small portion of them. **Option C is incorrect** because storytelling continues to be important despite advances in technology. **Option D is incorrect** because religions engage in storytelling mainly to transmit values and ideals rather than to discredit other faiths.

6. Which of the following events was a result of human interaction with the environment during the Spanish colonial era of Texas history?

- A. The construction of presidios near churches
- B. The conversion of American Indians to Christianity
- C. The building of acequias for the missions
- D. The creation of alcaldes for civil settlements

Answer

Option C is correct because acequias were ditches dug to direct river water toward the missions. **Option A is incorrect** because presidios were built to protect the missions. **Option B is incorrect** because it does not pertain to human interaction with the environment. **Option D is incorrect** because alcaldes are judges used in civil settlements.

7. Texas rice farmers depend on water from the Colorado River to irrigate their crops. In times of severe drought, less water is released downstream, which sometimes results in inadequate irrigation and failed crops. To prevent such a loss, rice farmers sometimes plant alternative crops on their lands. This action is an example of

- A. adapting to environmental changes.
- B. adjusting to supply and demand.
- C. using nonrenewable resources to improve farming.
- D. modifying the environment to meet farming needs.

Answer

Option A is correct because the farmers are changing their choice of crop to adapt to the change in environment. **Option B is incorrect** because supply and demand is an economic concept that refers to the relationship between price and quantity. This question refers to adapting to an environmental change. **Option C is incorrect** because water is considered a renewable resource. In addition, the stem refers to a lack of water being the cause of failed crops. **Option D is incorrect** because the farmers are making a change in their behavior to adapt to the environment, not modifying the environment to meet farming needs.

Competency 004—(Economics): The teacher understands and applies knowledge of economic systems and how people organize economic systems to produce, distribute and consume goods and services.

Use the information below to answer the question that follows.

ANNUAL EMPLOYMENT CHANGE, 1998–2003

| Year | Percent Change in Employment in the United States | Percent Change in Employment in Texas |
|------|---|---------------------------------------|
| 1998 | 2.6% | 3.8% |
| 1999 | 2.4% | 2.4% |
| 2000 | 2.2% | 3.0% |
| 2001 | 0.0% | 0.9% |
| 2002 | -1.1% | -1.0% |
| 2003 | -0.3% | -0.5% |

Source: Texas Comptroller of Public Accounts and IHS Global Insight Inc.

8. Which of the following observations most accurately correlates with the chart above?

- A. Texas outpaced the United States overall in employment growth between 1999 and 2000.
- B. Texas added significantly more jobs than any other state in 1998.
- C. The most significant variance in employment change between Texas and the United States overall occurred in 2002.
- D. Employment growth in all states declined in 2002 compared with the stable growth in 2001.

Answer

Option A is correct because between 1999 and 2000, Texas employment growth increased from 2.4 percent to 3.0 percent while the overall United States employment growth decreased from 2.4 percent to 2.2 percent. **Option B is incorrect** because the chart does not compare Texas to any other individual state. **Option C is incorrect** because the most significant variance between the United States and Texas did not occur in 2002. **Option D is incorrect** because the chart does not provide information about other individual states.

9. Based on the economic principles of supply and demand, a decrease in the production rates of oil will most likely result in which of the following?

- A. Increased capital investment in the oil industry
- B. Increased wages for oil-field workers

- C. Increased stock of produced oil
- D. Increased oil prices for consumers

Answer

Option D is correct because when supply falls, the temporary shortage drives up the price. **Option A is incorrect** because lower production will not encourage capital investment. **Option B is incorrect** because if production decreases, the demand for labor will decrease, lowering wages for workers. **Option C is incorrect** because if oil production is decreased, there will be less available oil for use.

Competency 005—(Government and Citizenship): The teacher understands and applies knowledge of concepts of government, democracy and citizenship, including ways that individuals and groups achieve their goals through political systems.

Read the excerpt below and answer the question that follows.

"There is an opinion that parties in free countries are useful checks upon the administration of the government and serve to keep alive the spirit of liberty. This within certain limits is probably true; and in governments of a monarchical cast, patriotism may look with indulgence, if not with favor, upon the spirit of party. But in those of the popular character, in governments purely elective, it is a spirit not to be encouraged. From their natural tendency, it is certain there will always be enough of that spirit for every salutary purpose. And there being constant danger of excess, the effort ought to be by force of public opinion, to mitigate and assuage it. A fire not to be quenched, it demands a uniform vigilance to prevent its bursting into a flame, lest, instead of warming, it should consume."

10. In the excerpt above from his final speech as president, George Washington urged United States citizens to
- A. repay the national debt.
 - B. avoid foreign alliances.
 - C. limit freedom of speech.
 - D. refrain from joining political parties.

Answer

Option D is correct because Washington is discussing his beliefs about the dangers of political parties in the United States. Washington believed that the formation of political parties might affect the nation's ability to make effective decisions. **Option A is incorrect** because Washington was not discussing the national debt. **Option B is incorrect** because the excerpt does not mention foreign alliances, although Washington did address the subject elsewhere in the speech. **Option C is incorrect** because Washington was concerned about factions and not individual citizens' freedom of speech.

11. Which of the following is a responsibility of citizenship?

- A. Running for elected office
- B. Paying federal taxes
- C. Serving in the military
- D. Participating in elections

Answer

Option B is correct because it refers to an obligatory rather than a voluntary aspect of citizenship. **Options A, C and D are incorrect** because they refer to voluntary aspects of citizenship.

12. Which of the following was the primary purpose of adding the Bill of Rights to the United States Constitution?

- A. Creating explicit limits on the power of the federal government
- B. Granting the power of judicial review to the Supreme Court
- C. Ceding sovereignty to the individual states
- D. Amending errors in the Constitution

Answer

Option A is correct because the Bill of Rights was adopted to address the fears of those who thought that the federal government's powers under the Constitution were too broad. **Option B is incorrect** because the Bill of Rights does not mention or enumerate the power of judicial review. **Option C is incorrect** because the Bill of Rights focuses on individual rights rather than the powers of state governments. **Option D is incorrect** because the Bill of Rights was not intended to correct errors in the Constitution.

Preparation Manual

Section 7: Sample Selected-Response Questions Core Subjects EC–6 Subject Exam IV—Science (904)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam IV Sample Questions

Competency 001—(Lab Processes, Equipment and Safety): The teacher understands how to manage learning activities, tools, materials, equipment and technologies to ensure the safety of all students.

1. Which of the following is equivalent to 200 centimeters?

- A. 2 millimeters
- B. 20 millimeters
- C. 0.2 meter
- D. 2 meters

Answer _____

Competency 002—(History and Nature of Science): The teacher understands the history and nature of science, the process and role of scientific inquiry and the role of inquiry in science instruction.

2. Of the following, which best demonstrates the use of an inquiry-based activity during a unit on physical properties of matter?

- A. Creating a graphic organizer of physical properties, using a textbook
- B. Describing the physical properties of different objects in a journal
- C. Matching terms that describe physical properties with their definitions
- D. Separating a mixture, using the physical properties of its components

Answer _____

Competency 003—(Impact of Science): The teacher understands how science impacts the daily lives of students and interacts with and influences personal and societal decisions.

3. Of the following, which is the leading cause of preventable death in the United States?

- A. Distracted driving
- B. Infectious diseases
- C. Sedentary lifestyle
- D. Tobacco use

Answer _____

Competency 004—(Concepts and Processes): The teacher knows and understands the unifying concepts and processes that are common to all sciences.

4. When a vast amount of ash is expelled from a volcano during a catastrophic eruption, some of this ash can remain in the atmosphere for years. Which of the following changes in Earth's system most likely results from this situation?

- A. Decreased solar reflection leading to higher global temperatures
- B. Decreased solar reflection leading to lower global temperatures
- C. Increased solar reflection leading to higher global temperatures
- D. Increased solar reflection leading to lower global temperatures

Answer _____

Competency 005—(Students as Learners and Science Instruction): The teacher has theoretical and practical knowledge about teaching science and about how students learn science.

5. Of the following activities, which best introduces to students the process skill of classification?

- A. Measuring the time it takes a marble to reach the bottom of an inclined plane when dropped from different heights
- B. Sorting a collection of objects into metals and nonmetals, then sorting the metals into magnetic and nonmagnetic
- C. Modeling the faces of the moon using a foam ball and light, then describing and drawing their observations
- D. Representing the stages of the life cycle of a butterfly using craft materials provided by the teacher

Answer _____

Competency 006—(Science Assessment): The teacher knows the varied and appropriate assessments and assessment practices for monitoring science learning in laboratory, field and classroom settings.

6. A class has just completed a unit on the anatomy of a flower. Which of the following is the most effective way for a teacher to assess the students' understanding of the concept?

- A. Having the students dissect a flower and label the parts
- B. Having the students write a paragraph about the pollination of flowers
- C. Having the students write the definitions of the different parts of the flowers
- D. Having the students plant seeds and measure the time it takes for the plants to flower

Answer _____

Competency 007—(Forces and Motion): The teacher understands forces and motion and their relationships.

7. An object is being acted on by a force of 20 N directed to the left and a force of 30 N directed to the right. What is the net force acting on the object?

- A. 10 N to the left
- B. 50 N to the left
- C. 10 N to the right
- D. 50 N to the right

Answer _____

Competency 008—(Physical and Chemical Properties): The teacher understands the physical and chemical properties of and changes in matter.

8. Of the following mixtures, which can be most effectively separated into its components using a mesh screen?

- A. Oil and water
- B. Sand and water
- C. Sand and pebbles
- D. Table sugar and water

Answer _____

Competency 009—(Energy and Interactions): The teacher understands energy and interactions between matter and energy.

9. When wood burns, which of the following energy transformations occurs?

- A. Nuclear energy into mechanical energy
- B. Chemical energy into heat energy
- C. Light energy into mechanical energy
- D. Electrical energy into heat energy

Answer _____

Competency 010—(Energy Transformations and Conservation): The teacher understands energy transformations and the conservation of matter and energy.

10. As a demonstration during a unit on weather, a teacher adds food coloring to the bottom of a beaker of water being heated on a hot plate, and the students observe the movement of color in the water. Which of the following processes is illustrated by the movement of the color?

- A. Conduction
- B. Convection
- C. Evaporation

D. Radiation

Answer _____

Competency 011—(Structure and Function of Living Things): The teacher understands the structure and function of living things.

11. Which of the following is the stage in the life cycle of a butterfly that is the major period of feeding and growth?

- A. Adult
- B. Egg
- C. Larva
- D. Pupa

Answer _____

Competency 012—(Reproduction and the Mechanisms of Heredity): The teacher understands reproduction and the mechanisms of heredity.

12. Which of the following is the best example of a learned behavior in animals?

- A. A bird migrating in the spring
- B. An opossum hiding in grass when startled
- C. A chimpanzee using tools to access food
- D. A bear hibernating in winter

Answer _____

Competency 013—(Adaptations and Evolution): The teacher understands adaptations of organisms and the theory of evolution.

13. Which of the following is the adaptation that will best aid plant survival in an arid environment?

- A. Waxy leaves
- B. Aerial roots
- C. Broad leaves
- D. Green flowers

Answer _____

Competency 014—(Organisms and the Environment): The teacher understands the relationships between organisms and the environment.

14. Which of the following is the relationship in which organism A benefits from living on or in the body of organism B but provides no benefit to organism B?

- A. Parasitism
- B. Predation

- C. Competition
- D. Mutualism

Answer _____

Competency 015—(Structure and Function of Earth Systems): The teacher understands the structure and function of Earth systems.

15. The two most abundant gases in Earth's atmosphere are
- A. oxygen and nitrogen.
 - B. oxygen and carbon dioxide.
 - C. oxygen and water vapor.
 - D. oxygen and hydrogen.

Answer _____

Competency 016—(Cycles in Earth Systems): The teacher understands cycles in Earth systems.

16. Which of the following is the Coriolis effect most likely to influence?
- A. The amount of solar radiation reaching Earth's surface
 - B. The height of a tsunami
 - C. The dew point of an air mass
 - D. The circulation pattern of global wind belts

Answer _____

Competency 017—(Energy in Weather and Climate): The teacher understands the role of energy in weather and climate.

17. Which of the following is most likely to occur when a warm air mass meets a cold air mass at Earth's surface?
- A. The sky will become clear.
 - B. All wind will cease.
 - C. Clouds will form and inclement weather will usually develop.
 - D. The air pressure will increase and fog will form.

Answer _____

Competency 018—(Solar System and the Universe): The teacher understands the characteristics of the solar system and the universe.

18. Which of the following are planets? Select all that apply.
- A. Mars
 - B. Mercury

C. Neptune

D. Titan

Answer _____

Preparation Manual

Section 7: Sample Selected-Response Answers and Rationales Core Subjects EC–6 Subject Exam IV—Science (904)

This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam IV Sample Questions

Competency 001—(Lab Processes, Equipment and Safety): The teacher understands how to manage learning activities, tools, materials, equipment and technologies to ensure the safety of all students.

1. Which of the following is equivalent to 200 centimeters?

- A. 2 millimeters
- B. 20 millimeters
- C. 0.2 meter
- D. 2 meters

Answer

Option D is correct because there are 100 centimeters in 1 meter, therefore 200 centimeters is equivalent to 2 meters. **Option A is incorrect** because there are 10 millimeters in 1 centimeter, therefore 2 millimeters is equivalent to 0.2 centimeters. **Option B is incorrect** because there are 10 millimeters in 1 centimeter, therefore 20 millimeters is equivalent to 2 centimeters. **Option C is incorrect** because there are 100 centimeters in 1 meter, therefore 0.2 meter is equivalent to 20 centimeters.

Competency 002—(History and Nature of Science): The teacher understands the history and nature of science, the process and role of scientific inquiry and the role of inquiry in science instruction.

2. Of the following, which best demonstrates the use of an inquiry-based activity during a unit on physical properties of matter?

- A. Creating a graphic organizer of physical properties, using a textbook
- B. Describing the physical properties of different objects in a journal
- C. Matching terms that describe physical properties with their definitions
- D. Separating a mixture, using the physical properties of its components

Answer

Option D is correct because the activity of separating a mixture into its components engages the students and develops inquiry skills such as conducting investigations, gathering data, analyzing evidence, and logical reasoning. **Option A is incorrect** because although creating a graphic organizer may facilitate learning, it is not an inquiry-based activity. **Option B is incorrect** because although describing physical properties may improve observation and communication skills, by itself it is not an inquiry-based activity. **Option C is incorrect** because although matching terms with definitions may be appropriate to introduce and reinforce concept vocabulary, it is not an inquiry-based activity.

Competency 003—(Impact of Science): The teacher understands how science impacts the daily lives of students and interacts with and influences personal and societal decisions.

3. Of the following, which is the leading cause of preventable death in the United States?

- A. Distracted driving
- B. Infectious diseases
- C. Sedentary lifestyle
- D. Tobacco use

Answer

Option D is correct because tobacco use, in particular tobacco smoking, is the leading cause of death in the United States and worldwide. Tobacco use is a major risk factor for heart and lung diseases, including lung cancer. **Options A and C are incorrect** because although they are significant causes of death, they do not cause as many deaths as tobacco use. **Option B is incorrect** because although some actions may prevent the spread of infectious diseases, not all deaths caused by infectious diseases are preventable.

Competency 004—(Concepts and Processes): The teacher knows and understands the unifying concepts and processes that are common to all sciences.

4. When a vast amount of ash is expelled from a volcano during a catastrophic eruption, some of this ash can remain in the atmosphere for years. Which of the following changes in Earth's system most likely results from this situation?

- A. Decreased solar reflection leading to higher global temperatures
- B. Decreased solar reflection leading to lower global temperatures
- C. Increased solar reflection leading to higher global temperatures
- D. Increased solar reflection leading to lower global temperatures

Answer

Option D is correct because as more ash is added to the atmosphere, sunlight is more liable to bounce off the ash particles and be reflected back into space. When less sunlight passes through the atmosphere, Earth's surface and atmosphere remain cooler. **Options A and B are incorrect** because an increase in volcanic ash in the atmosphere does not decrease the amount of sunlight that is reflected. **Option C is incorrect** because although solar reflection is increased, this does not lead to higher temperatures.

Competency 005—(Students as Learners and Science Instruction): The teacher has theoretical and practical knowledge about teaching science and about how students learn science.

5. Of the following activities, which best introduces to students the process skill of classification?

- A. Measuring the time it takes a marble to reach the bottom of an inclined plane when dropped from different heights
- B. Sorting a collection of objects into metals and nonmetals, then sorting the metals into magnetic and nonmagnetic
- C. Modeling the faces of the moon using a foam ball and light, then describing and drawing their observations
- D. Representing the stages of the life cycle of a butterfly using craft materials provided by the teacher

Answer

Option B is correct because the students are performing two consecutive binary classifications based on the physical properties of the objects. **Option A is incorrect** because this activity best introduces students to the process skill of measurement and the concepts of change and constancy. **Option C is incorrect** because this activity best introduces students to the process of skills of observation and communication and the concept of models. **Option D is incorrect** because this activity best introduces students to the concepts of change and constancy.

Competency 006—(Science Assessment): The teacher knows the varied and appropriate assessments and assessment practices for monitoring science learning in laboratory, field and classroom settings.

6. A class has just completed a unit on the anatomy of a flower. Which of the following is the most effective way for a teacher to assess the students' understanding of the concept?

- A. Having the students dissect a flower and label the parts
- B. Having the students write a paragraph about the pollination of flowers
- C. Having the students write the definitions of the different parts of the flowers
- D. Having the students plant seeds and measure the time it takes for the plants to flower

Answer

Option A is correct because dissecting a flower and labeling the parts demands that the students make the connection between the appearance and location of the parts of an actual flower to descriptions and two-dimensional images of a flower. **Option B is incorrect** because this activity focuses on the function, not the anatomy, of the parts of a flower. **Option C is incorrect** because it does not assess students' ability to visually identify parts of the flower. **Option D is incorrect** because this activity emphasizes the life cycle of a flowering plant, not the anatomy of the flower.

Competency 007—(Forces and Motion): The teacher understands forces and motion and their relationships.

7. An object is being acted on by a force of 20 N directed to the left and a force of 30 N directed to the right. What is the net force acting on the object?

- A. 10 N to the left
- B. 50 N to the left
- C. 10 N to the right
- D. 50 N to the right

Answer

Option C is correct because forces are vector quantities; thus, both magnitude and direction must be considered when adding. In the example, the forces are acting in opposite directions, so the net magnitude of the force is 10 N. The force directed to the right is greater, so the net force is directed to the right. **Option A is incorrect** because it assumes that the force directed to the left is greater. **Option B is incorrect** because it assumes that both forces are directed to the left. **Option D is incorrect** because it assumes that both forces are directed to the right.

Competency 008—(Physical and Chemical Properties): The teacher understands the physical and chemical properties of and changes in matter.

8. Of the following mixtures, which can be most effectively separated into its components using a mesh screen?

- A. Oil and water
- B. Sand and water
- C. Sand and pebbles
- D. Table sugar and water

Answer

Option C is correct because mesh screens or sieves are used to separate solid materials based on particle size. The particle size of sand is less than 2 mm while the particle size of gravel is greater than 2 mm. Therefore a screen with openings of 2 mm can be used to separate sand and gravel. **Option A is incorrect** because both oil and water are liquids and will flow through a screen. **Option B is incorrect** because sand is most effectively separated from water using filter paper because the pores in the filter paper are so small that the water will pass through but not the sand. **Option D is incorrect** because table sugar dissolves in water and is most effectively separated from water by evaporation.

Competency 009—(Energy and Interactions): The teacher understands energy and interactions between matter and energy.

9. When wood burns, which of the following energy transformations occurs?

- A. Nuclear energy into mechanical energy
- B. Chemical energy into heat energy
- C. Light energy into mechanical energy
- D. Electrical energy into heat energy

Answer

Option B is correct because when wood burns, chemical energy is converted to heat energy. Some of the chemical energy stored in the chemical bonds of the substances in wood is released as heat during the combustion process. **Options A, C and D are incorrect** because these energy transformations do not occur when wood burns.

Competency 010—(Energy Transformations and Conservation): The teacher understands energy transformations and the conservation of matter and energy.

10. As a demonstration during a unit on weather, a teacher adds food coloring to the bottom of a beaker of water being heated on a hot plate, and the students observe the movement of color in the water. Which of the following processes is illustrated by the movement of the color?

- A. Conduction
- B. Convection
- C. Evaporation
- D. Radiation

Answer

Option B is correct because convection is the process of heat transfer by currents in fluids. Convection plays an important role in both global and local weather phenomena. **Option A is incorrect** because conduction involves the transfer of heat by the exchange of kinetic energy between colliding particles. **Option C is incorrect** because evaporation is the process that occurs when liquid at the surface enters the air in the gas phase. **Option D is incorrect** because radiation is the process of energy transfer by electromagnetic waves.

Competency 011—(Structure and Function of Living Things): The teacher understands the structure and function of living things.

11. Which of the following is the stage in the life cycle of a butterfly that is the major period of feeding and growth?

- A. Adult
- B. Egg
- C. Larva
- D. Pupa

Answer

Option C is correct because the larval (caterpillar) stage is the major feeding and growth stage. **Option A is incorrect** because the adult stage is primarily a reproductive stage. **Option B is incorrect** because the egg stage is not the feeding and growth stage. **Option D is incorrect** because the pupal stage is the stage of metamorphosis from caterpillar to adult.

Competency 012—(Reproduction and the Mechanisms of Heredity): The teacher understands reproduction and the mechanisms of heredity.

12. Which of the following is the best example of a learned behavior in animals?

- A. A bird migrating in the spring
- B. An opossum hiding in grass when startled
- C. A chimpanzee using tools to access food
- D. A bear hibernating in winter

Answer

Option C is correct because chimpanzees learn to use tools by watching older chimpanzees use tools. **Option A is incorrect** because migrating is not learned by watching older birds. **Option B is incorrect** because hiding in the grass is not learned by watching older opossums. **Option D is incorrect** because hibernating is not learned by watching older bears.

Competency 013—(Adaptations and Evolution): The teacher understands adaptations of organisms and the theory of evolution.

13. Which of the following is the adaptation that will best aid plant survival in an arid environment?

- A. Waxy leaves
- B. Aerial roots
- C. Broad leaves
- D. Green flowers

Answer

Option A is correct because having a waxy surface decreases water loss from leaves, aiding plant survival in an arid environment. **Option B is incorrect** because aerial roots are not an adaptation to aid plant survival in an arid environment. **Option C is incorrect** because broad leaves are not an adaptation to aid plant survival in an arid environment. **Option D is incorrect** because green flowers are not an adaptation to aid plant survival in an arid environment.

Competency 014—(Organisms and the Environment): The teacher understands the relationships between organisms and the environment.

14. Which of the following is the relationship in which organism A benefits from living on or in the body of organism B but provides no benefit to organism B?

- A. Parasitism
- B. Predation
- C. Competition
- D. Mutualism

Answer

Option A is correct because parasitism is a relationship between organisms in which one organism benefits from living on or in the body of another organism, usually at the expense of the other organism. **Option B is incorrect** because predation is a relationship between organisms in which one organism feeds on another organism; the predator is generally larger than the organism on which it feeds. **Option C is incorrect** because competition is a relationship between organisms in which the organisms compete with each other for the same resources. **Option D is incorrect** because mutualism is a relationship between two organisms in which both organisms benefit.

Competency 015—(Structure and Function of Earth Systems): The teacher understands the structure and function of Earth systems.

15. The two most abundant gases in Earth's atmosphere are

- A. oxygen and nitrogen.
- B. oxygen and carbon dioxide.
- C. oxygen and water vapor.
- D. oxygen and hydrogen.

Answer

Option A is correct because in a sample of dry air near Earth's surface, approximately 99% is oxygen (about 21%) and nitrogen (78%). **Option B is incorrect** because it lists carbon dioxide, which accounts for approximately 0.036% of Earth's atmosphere. **Option C is incorrect** because it lists water vapor, which is the most variable

component of the atmosphere, but it typically ranges between 1% and 4%. **Option D is incorrect** because it lists hydrogen, which is found only in trace amounts in the atmosphere.

Competency 016—(Cycles in Earth Systems): The teacher understands cycles in Earth systems.

16. Which of the following is the Coriolis effect most likely to influence?

- A. The amount of solar radiation reaching Earth's surface
- B. The height of a tsunami
- C. The dew point of an air mass
- D. The circulation pattern of global wind belts

Answer

Option D is correct because the Earth rotates, and as air moves, it undergoes an apparent deflection from its path, as seen by an observer on Earth. This apparent deflection is called the Coriolis effect and is a result of Earth's rotation. **Option A is incorrect** because the amount of incoming solar radiation reaching Earth's surface is dependent on latitude and the tilt of Earth's axis and is not influenced by Earth's rotation. **Option B is incorrect** because tsunami height is dependent on the speed and wavelength of the ocean wave and on the topography of the coastline. **Option C is incorrect** because dew point is dependent on the amount of water vapor present in air as well as the air temperature.

Competency 017—(Energy in Weather and Climate): The teacher understands the role of energy in weather and climate.

17. Which of the following is most likely to occur when a warm air mass meets a cold air mass at Earth's surface?

- A. The sky will become clear.
- B. All wind will cease.
- C. Clouds will form and inclement weather will usually develop.
- D. The air pressure will increase and fog will form.

Answer

Option C is correct because the boundary of air masses of two distinct temperatures is called a front. Along cold fronts and warm fronts, clouds develop as the less dense warm air rises above the cooler air. This allows for the formation of clouds, and usually precipitation occurs. **Option A is incorrect** because when two air masses of different temperatures meet, one is usually forced to rise, producing cooling, condensation, and cloud formation. **Option B is incorrect** because the boundary between two opposing air masses is a meteorologically unstable place, and the air is unlikely to be still because of the pressure and temperature differences. **Option D is incorrect** because rising warm air usually produces lower air pressure, and fog usually forms when water vapor condenses at the dew point, a result of air getting cooler.

Competency 018—(Solar System and the Universe): The teacher understands the characteristics of the solar system and the universe.

18. Which of the following are planets? Select all that apply.

- A. Mars
- B. Mercury
- C. Neptune

D. Titan

Answer

Options A, B and C are correct because Mars, Mercury and Neptune meet all the conditions set by the International Astronomical Union to be classified as planets. According to the IAU definition, a planet is a celestial body that is in orbit around the Sun, has sufficient mass to assume a nearly round shape, and has cleared the neighborhood around its orbit. **Option D is incorrect** because Titan is the largest moon of Saturn.

Preparation Manual

Section 8: Sample Selected-Response Questions Core Subjects EC–6 Subject Exam V—Fine Arts, Health and Physical Education (905)

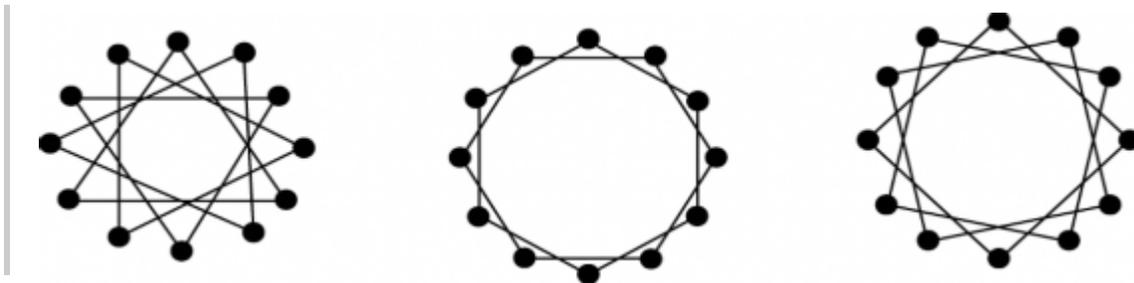
This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam V Sample Questions

Competency 001—(Visual Arts): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of art and uses that knowledge to plan and implement effective and engaging visual arts instruction.

1. An art teacher has her sixth-grade students use a compass, ruler and colored pencils to create a design that will be woven onto a pegged piece of wood in the form of string art as shown below.



The activity would be most appropriate for which of the following interdisciplinary units?

- A. A social studies unit on Medieval stained glass
- B. A science unit about rain and snow
- C. A reading unit focused on sequencing ideas
- D. A math unit on geometric shapes and angles

Answer _____

2. Students are each given three identical small lumps of modeling clay and are asked to sculpt three different hearts from the lumps. For example, the hearts can be plump or slender, with varying proportions. The activity will best help students understand the art element of

- A. line.
- B. form.
- C. texture.
- D. light.

Answer _____

3. During a unit on fiber art, it would be most appropriate for students to learn how to use a

- A. handloom.
- B. press mold.
- C. palette knife.
- D. lathe chisel.

Answer _____

4. A fifth-grade teacher instructs students to use a camera to take pictures of various objects around the school. The students are to use the following methods when taking pictures.

- Shoot from up high and down low.
- Shoot from different sides and angles.

The activity will best help students understand the visual concept of

- A. balance.
- B. narrative.
- C. symbolism.
- D. perspective.

Answer _____

5. Second-grade students each place thin paper over an object they have found in the classroom and rub a crayon over the paper on part of the surface of the object. The activity can most effectively be used to introduce students to which of the following elements of art?

- A. Texture
- B. Space
- C. Line
- D. Shape

Answer _____

Competency 002—(Music): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of music and uses that knowledge to plan and implement effective and engaging music instruction.

6. When teaching students about the lines and spaces of the grand staff, the mnemonic "All Cows Eat Grass" helps them remember

- A. the lines of the treble clef.
- B. the spaces of the treble clef.
- C. the lines of the bass clef.
- D. the spaces of the bass clef.

Answer _____

7. A type of song in which a second voice exactly imitates a leading voice at different places in the melody is a

- A. Round
- B. Partner song
- C. Lullaby
- D. Game song

Answer _____

8. Which of the following traditional folk songs promotes the heritage of Texas?

- A. "The Old Chisholm Trail"
- B. "Cotton-Eyed Joe"
- C. "Casey Jones"
- D. "Sweet Betsy from Pike"

Answer _____

9. Which of the following types of children's songs combine singing and movement in order to promote enjoyment of music and develop music literacy in students?

- A. Work songs
- B. Spirituals
- C. Jingles
- D. Game songs

Answer _____

10. Which of the following should students be able to do in order to begin improvising songs?

- A. Notate from dictation
- B. Sing in tune
- C. Read music
- D. Know the blues style

Answer _____

11. When teaching students to sing using the Kodály method, which of the following is the first interval taken from folk songs and used in echo singing?

- A. Ti-do
- B. Mi-do
- C. Sol-mi
- D. La-ti

Answer _____

12. Which of the following musical terms tells the performer to play loudly, then immediately play quietly?

- A. cresc.
- B. mf
- C. dim.
- D. fp

Answer _____

Competency 003—(Health): The teacher uses knowledge of the concepts and purposes of health education to plan and implement effective and engaging health instruction.

13. A common type of family abuse characterized by verbal put-downs and criticisms is known as

- A. abuse of power.
- B. emotional abuse.
- C. physical abuse.
- D. sexual abuse.

Answer _____

14. Which of the following phrases best describes the human digestive system?

- A. A group of similar organs that function independently
- B. A continuous tube with attached organs that performed different functions
- C. A group of similar organs connected by a network of blood vessels
- D. A system of organs that provide for food storage in the body

Answer _____

15. Which of the following behaviors is most likely to reduce a person's risk of developing melanoma?

- A. Avoiding cigarettes
- B. Abstaining from alcohol use
- C. Avoiding exposure to carcinogenic chemicals
- D. Protecting the skin against excessive exposure to the sun

Answer _____

Competency 004—(Physical Education): The teacher uses knowledge of the concepts, principles, skills and practices of physical education to plan and implement effective and engaging physical education instruction.

16. Which of the following terms describes the phenomenon of a young child having greater control of his or her upper torso than of his or her legs or feet?

- A. Component stages
- B. Proximodistal development
- C. Developmental biodynamics
- D. Cephalocaudal development

Answer _____

17. Which of the following forms of movement most clearly demonstrates basic skill in nonlocomotor body management?

- A. Hopping up and down
- B. Standing on a balance beam
- C. Leaping with variation in distance
- D. Throwing an object various distances

Answer _____

18. A first-grade teacher is having students march to the sound of a drum. Which of the following instructions is most appropriate for teaching the movement concepts of spatial awareness and relationship awareness?

- A. Follow the person in front of you, but keep a comfortable distance between you.
- B. Stomp your foot on the fourth beat of each measure, and turn to your right.
- C. March faster as the drumbeat gets faster, but freeze when the drumbeat stops.
- D. Time your steps so that your foot touches the ground at the same time that the drumbeat occurs.

Answer _____

19. Several students in a physical education class are having difficulty reaching the basketball goal with their shots, even while using a youth-sized basketball. Which of the following options is most appropriate for the teacher to introduce to increase the students' success?

- A. Allowing students to use a balloon instead of a basketball
- B. Lowering the height of the basket
- C. Raising the height of the basket
- D. Using a bouncy playground ball instead of a basketball

Answer _____

20. During a lesson on hitting a ball placed on a tee, a third-grade student is swinging the bat down on the ball from above rather than swinging parallel to the ground. Which of the following is most appropriate for the teacher to use first to help the student improve batting form?

- A. Physically guiding the swing to give the student the experience of proper technique
- B. Having the student watch other students perform the skill correctly and pointing out the other students' strengths
- C. Reminding the student to swing the bat in a plane that is parallel to the ground rather than in a vertical arc

- D. Using the bat to strike the ball from above, then from the side, and asking the student to watch where the ball goes each time

Answer _____

21. According to current research in the field of physical education, which of the following best promotes student participation in lifelong physical activity?

- A. Learning how to play popular sports and games
- B. Playing for a team that wins games regularly
- C. Acquiring basic skills needed to participate in a variety of activities
- D. Becoming familiar with common gymnasium equipment

Answer _____

Competency 005—(Theatre): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of theatre and uses that knowledge to plan and implement effective and engaging theatre instruction.

22. A fourth-grade teacher has students read about famous figures from Texas history and then takes the class to see a play about the life and times of Davy Crockett. Taking the class to see the play will best accomplish which of the following objectives?

- A. Enhancing lessons in social studies through a culturally relevant theatrical event
- B. Creating critical consumers of theatre arts through an evaluation of historical fiction
- C. Having students use social studies skills to compare and contrast primary and secondary sources
- D. Having students recognize the influence of theatre on historical events

Answer _____

23. Which of the following is most likely to help fourth-grade students understand the concept of characterization?

- A. Having students read and watch a variety of interviews with a noted author
- B. Having students act out the sounds and movements of various animals from a familiar story
- C. Directing students in a classroom performance of a play that is based on a familiar story
- D. Coaching individual students on the use of vocal inflection in reciting stories

Answer _____

24. While discussing a play they recently saw, students note that one of the characters often appeared onstage in the shadows. When confronted with upsetting news, the same character was shown in red light. As described, which of the following is a primary purpose of the lighting?

- A. Enhancing performance visibility
- B. Directing an actor's movement
- C. Prompting inferences about the character's personality
- D. Developing a realistic setting for the character

Answer _____

Preparation Manual

Section 8: Sample Selected-Response Answers and Rationales Core Subjects EC–6 Subject Exam V—Fine Arts, Health and Physical Education (905)

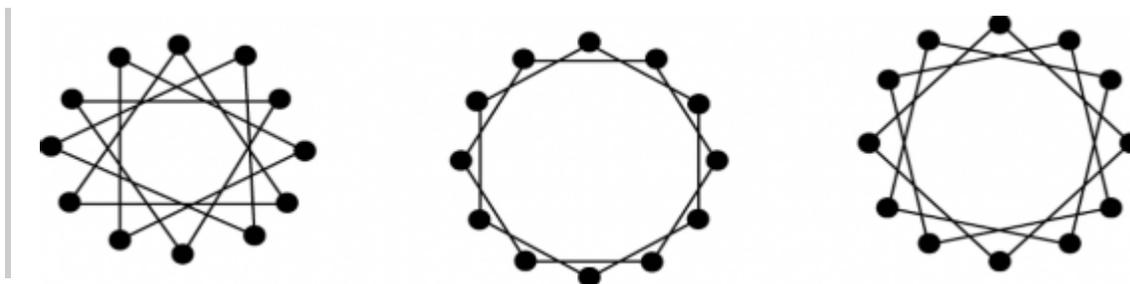
This section presents some sample exam questions for you to review as part of your preparation for this Subject Exam. To demonstrate how each competency may be assessed, sample questions are accompanied by the competency that they measure. While studying, you may wish to read the competency before and after you consider each sample question. Please note that the competency statements do not appear on the actual exam.

For each sample exam question, there is a correct answer and a rationale for each answer option. The sample questions are included to illustrate the formats and types of questions you will see on the Subject Exam; however, your performance on the sample questions should not be viewed as a predictor of your performance on the actual exam.

Subject Exam V Sample Questions

Competency 001—(Visual Arts): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of art and uses that knowledge to plan and implement effective and engaging visual arts instruction.

1. An art teacher has her sixth-grade students use a compass, ruler and colored pencils to create a design that will be woven onto a pegged piece of wood in the form of string art as shown below.



The activity would be most appropriate for which of the following interdisciplinary units?

- A. A social studies unit on Medieval stained glass
- B. A science unit about rain and snow
- C. A reading unit focused on sequencing ideas
- D. A math unit on geometric shapes and angles

Answer

Option D is correct because wrapping the string on the pegs in different patterns creates corresponding differences in angles and shapes. **Option A is incorrect** because only a subset of Medieval stained glass consists of circular, geometric designs; most of it is pictorial. **Option B is incorrect** because although snowflakes are radial forms, they contain six points whereas the pegboards each include twelve pegs and rain is unrelated to the activity. **Option C is incorrect** because the sequence of ideas in reading is linear, unlike these circular patterns.

2. Students are each given three identical small lumps of modeling clay and are asked to sculpt three different hearts from the lumps. For example, the hearts can be plump or slender, with varying proportions. The activity will best help students understand the art element of

- A. line.
- B. form.
- C. texture.
- D. light.

Answer

Option B is correct because form means the volume and shape of a three-dimensional object. Varying the physical characteristics of the hearts made from the same amount of clay will create different forms. **Option A is incorrect** because line, at the level of elementary students, is understood as an element of two-dimensional art. **Option C is incorrect** because even though students might choose to vary the texture of the hearts, texture would still be secondary to the art element of form. **Option D is incorrect** because light is not part of this activity.

3. During a unit on fiber art, it would be most appropriate for students to learn how to use a

- A. handloom.
- B. press mold.
- C. palette knife.
- D. lathe chisel.

Answer

Option A is correct because a handloom is a tool for weaving, a common kind of fiber art. **Options B, C and D are incorrect** because, while they are all tools that are used with other art media, they are not used in fiber arts.

4. A fifth-grade teacher instructs students to use a camera to take pictures of various objects around the school. The students are to use the following methods when taking pictures.

- Shoot from up high and down low.
- Shoot from different sides and angles.

The activity will best help students understand the visual concept of

- A. balance.
- B. narrative.
- C. symbolism.
- D. perspective.

Answer

Option D is correct because the resulting photographs will demonstrate to the students how perspective (the illusion that images diminish in space along converging lines) is affected by different angles. **Options A, B and C are incorrect** because they could be part of a student's photograph but the exercise itself will not elicit any of them.

5. Second-grade students each place thin paper over an object they have found in the classroom and rub a crayon over the paper on part of the surface of the object. The activity can most effectively be used to introduce students to which of the following elements of art?

- A. Texture
- B. Space
- C. Line
- D. Shape

Answer

Option A is correct because the texture of each object will directly affect what the rubbings look like. **Options B, C and D are incorrect** because they are not part of this activity and will not naturally be present in the rubbings.

Competency 002—(Music): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of music and uses that knowledge to plan and implement effective and engaging music instruction.

6. When teaching students about the lines and spaces of the grand staff, the mnemonic "All Cows Eat Grass" helps them remember

- A. the lines of the treble clef.
- B. the spaces of the treble clef.
- C. the lines of the bass clef.
- D. the spaces of the bass clef.

Answer

Option D is correct because the spaces of the bass clef, beginning with the lowest space, are A-C-E-G. **Option A is incorrect** because the lines of the treble clef, beginning with the lowest line are E-G-B-D-F. **Option B is incorrect** because the spaces of the treble clef, beginning with the lowest space, are F-A-C-E. **Option C is incorrect** because the lines of the bass clef, beginning with the lowest line, are G-B-D-F-A.

7. A type of song in which a second voice exactly imitates a leading voice at different places in the melody is a

- A. Round
- B. Partner song
- C. Lullaby
- D. Game song

Answer

Option A is correct because a round is a song in which a leader is imitated exactly at one or more certain points within the song. **Option B is incorrect** because a partner song is a song that can be paired with another song and sung in unison to create harmony. **Option C is incorrect** because a lullaby is a song that is associated with engendering sleep. **Option D is incorrect** because a game song is a song that is associated with playing general or specific games.

8. Which of the following traditional folk songs promotes the heritage of Texas?

- A. "The Old Chisholm Trail"
- B. "Cotton-Eyed Joe"
- C. "Casey Jones"
- D. "Sweet Betsy from Pike"

Answer

Option A is correct because Texas ranchers used the Chisholm trail to drive cattle to the rail yards in Kansas. **Option B is incorrect** because the song originated in the Southern United States. **Option C is incorrect** because the song originated in the Northern Mid-West United States. **Option D is incorrect** because the lyrics describe travelling to the California Gold Rush.

9. Which of the following types of children's songs combine singing and movement in order to promote enjoyment of music and develop music literacy in students?

- A. Work songs
- B. Spirituals
- C. Jingles
- D. Game songs

Answer

Option D is correct because game songs are used throughout the world and by different cultures for play and enjoyment. Game songs often use movement and dance. Learning game songs helps to promote musicality among children and is the basis for becoming musically literate. **Option A is incorrect** because work songs are used by persons who are doing manual labor in order to pace themselves and to pass the time. **Option B is incorrect** because a spiritual is a song that is generally religious in nature and is not considered a child's song. Spirituals are not typically used in education to promote music literacy. **Option C is incorrect** because a jingle is a short song created for marketing and business purposes.

10. Which of the following should students be able to do in order to begin improvising songs?

- A. Notate from dictation
- B. Sing in tune
- C. Read music
- D. Know the blues style

Answer

Option B is correct because students must sing in-tune before they can improvise tonally. **Option A is incorrect** because, just as one may improvise using language without knowing how to write language, one may improvise music without being able to write music. **Option C is incorrect** because persons learning language and music do not need to learn how to read those forms of communication before they can improvise them. **Option D is incorrect** because students do not need to begin improvising by learning to improvise in the blues style.

11. When teaching students to sing using the Kodály method, which of the following is the first interval taken from folk songs and used in echo singing?

- A. Ti-do
- B. Mi-do
- C. Sol-mi
- D. La-ti

Answer

Option C is correct because it is the first interval that is within the Kodály sequence of intervals. **Option A is incorrect** because it is not the first interval in the Kodály sequence of intervals. **Option B is incorrect** because it is not the first interval in the Kodály sequence of intervals. **Option D is incorrect** because it is not the first interval in the Kodály sequence of intervals.

12. Which of the following musical terms tells the performer to play loudly, then immediately play quietly?

- A. cresc.
- B. mf
- C. dim.
- D. fp

Answer

Option D is correct because the symbol means to perform loudly then immediately quietly. **Option A is incorrect** because the symbol means to play increasingly louder. **Option B is incorrect** because it means to perform moderately loudly. **Option C is incorrect** because the symbol means to play increasingly more quietly.

Competency 003—(Health): The teacher uses knowledge of the concepts and purposes of health education to plan and implement effective and engaging health instruction.

13. A common type of family abuse characterized by verbal put-downs and criticisms is known as

- A. abuse of power.
- B. emotional abuse.
- C. physical abuse.
- D. sexual abuse.

Answer

Option B is correct because hurtful language can cause emotional distress and is recognized as a form of abuse. **Option A is incorrect** because abuse of power is typically misconduct committed by someone as part of a job or elected position. **Option C is incorrect** because physical abuse has to include physical violence, mistreatment, or neglect. **Option D is incorrect** because sexual abuse involves sexual activity against a person's will or with a person who cannot legally consent to the activity. (Sexual harassment can be of the verbal variety; however, it is not listed as one of the choices and is a different type of sexual abuse.)

14. Which of the following phrases best describes the human digestive system?

- A. A group of similar organs that function independently
- B. A continuous tube with attached organs that performed different functions
- C. A group of similar organs connected by a network of blood vessels

D. A system of organs that provide for food storage in the body

Answer

Option B is correct because the digestive system is a continuous tube that runs from the mouth to the anus and contains attached organs that perform different functions that aid in digestion and the breakdown of food. **Option A is incorrect** because while the organs in the digestive system do function somewhat independently, they are not all similar and have different functions. **Option C is incorrect** because the organs in the digestive system are not connected by blood vessels. **Option D is incorrect** because the digestive system does not store food; it breaks it down so the body can process nutrients and create waste products.

15. Which of the following behaviors is most likely to reduce a person's risk of developing melanoma?

- A. Avoiding cigarettes
- B. Abstaining from alcohol use
- C. Avoiding exposure to carcinogenic chemicals
- D. Protecting the skin against excessive exposure to the sun

Answer

Option D is correct because melanoma is a type of skin cancer that is primarily caused by long-term unprotected exposure to the sun. Option A is incorrect because smoking tobacco products is more commonly associated with lung cancer. **Option B is incorrect** because alcohol use does not lead to any known cancers. **Option C is incorrect** because exposure to various carcinogenic chemicals can cause any number of different types of cancer, but is not a primary cause of melanoma.

Competency 004—(Physical Education): The teacher uses knowledge of the concepts, principles, skills and practices of physical education to plan and implement effective and engaging physical education instruction.

16. Which of the following terms describes the phenomenon of a young child having greater control of his or her upper torso than of his or her legs or feet?

- A. Component stages
- B. Proximodistal development
- C. Developmental biodynamics
- D. Cephalocaudal development

Answer

Option D is correct because cephalocaudal development describes physical development that starts from the head, then progresses to the lower parts of the body, such as the legs and feet. **Option A is incorrect** because component stages are not a part of physical development. **Option B is incorrect** because proximodistal development describes physical development from the center of the body, such as the spinal cord, with progression outward to the fingers and toes. **Option C is incorrect** because developmental biodynamics is a field that describes brain, body, and behavior connections as related to motor development.

17. Which of the following forms of movement most clearly demonstrates basic skill in nonlocomotor body management?

- A. Hopping up and down
- B. Standing on a balance beam

- C. Leaping with variation in distance
- D. Throwing an object various distances

Answer

Option B is correct because standing on a balance beam is a form of movement that demonstrates the basic skill of nonlocomotor body management and balance. **Option A and C are incorrect** because hopping and leaping are locomotor skills. **Option D is correct** because throwing is a manipulative skill.

18. A first-grade teacher is having students march to the sound of a drum. Which of the following instructions is most appropriate for teaching the movement concepts of spatial awareness and relationship awareness?

- A. Follow the person in front of you, but keep a comfortable distance between you.
- B. Stomp your foot on the fourth beat of each measure, and turn to your right.
- C. March faster as the drumbeat gets faster, but freeze when the drumbeat stops.
- D. Time your steps so that your foot touches the ground at the same time that the drumbeat occurs.

Answer

Option A is correct because the direction to follow the person in front but keep comfortable distance is focused on the movement concept of spatial awareness. Spatial awareness is the ability to understand the position of objects in relation to each other and to oneself. It includes understanding the relationship of objects when there is a change in position. **Options B, C and D are incorrect** because the directions focus on how the body moves, not where the body moves.

19. Several students in a physical education class are having difficulty reaching the basketball goal with their shots, even while using a youth-sized basketball. Which of the following options is most appropriate for the teacher to introduce to increase the students' success?

- A. Allowing students to use a balloon instead of a basketball
- B. Lowering the height of the basket
- C. Raising the height of the basket
- D. Using a bouncy playground ball instead of a basketball

Answer

Option B is correct because by lowering the height of the basket, the teacher is decreasing the distance the students need to shoot and increasing the likelihood that they will succeed in making a basket. **Options A and D are incorrect** because modifying the ball will not make it easier for the students to reach the basket because a balloon will not travel that far and the playground ball will be too bouncy. **Option C is incorrect** because increasing the height of the basket will increase the distance the ball must travel and make the task more challenging for the students.

20. During a lesson on hitting a ball placed on a tee, a third-grade student is swinging the bat down on the ball from above rather than swinging parallel to the ground. Which of the following is most appropriate for the teacher to use first to help the student improve batting form?

- A. Physically guiding the swing to give the student the experience of proper technique
- B. Having the student watch other students perform the skill correctly and pointing out the other students' strengths

- C. Reminding the student to swing the bat in a plane that is parallel to the ground rather than in a vertical arc
- D. Using the bat to strike the ball from above, then from the side, and asking the student to watch where the ball goes each time

Answer

Option A is correct because students in a physical education setting generally learn best by doing. **Option B is incorrect** because actually performing the skill correctly with guidance is better for learning than watching others performing the skill correctly. **Option C is incorrect** because a third-grade student may not understand the meaning of "parallel to the ground" or "in a vertical arc." **Option D is incorrect** because proper form is the main concern of the teacher, not the direction the ball travels.

21. According to current research in the field of physical education, which of the following best promotes student participation in lifelong physical activity?

- A. Learning how to play popular sports and games
- B. Playing for a team that wins games regularly
- C. Acquiring basic skills needed to participate in a variety of activities
- D. Becoming familiar with common gymnasium equipment

Answer

Option C is correct because current research indicates that when students acquire the basic skills they need to participate in a variety of activities, they are more willing to do so and more confident in their ability. **Option A is incorrect** because not all popular sports and games will appeal to all students. **Option B is incorrect** because it is unlikely that students will always be on a winning team, and it is important for students to learn to win and lose gracefully. **Option D is incorrect** because becoming familiar with common gymnasium equipment will not teach skills or instill in students a desire to participate in lifelong physical activity.

Competency 005—(Theatre): The teacher understands the concepts, processes and skills involved in the creation, appreciation and evaluation of theatre and uses that knowledge to plan and implement effective and engaging theatre instruction.

22. A fourth-grade teacher has students read about famous figures from Texas history and then takes the class to see a play about the life and times of Davy Crockett. Taking the class to see the play will best accomplish which of the following objectives?

- A. Enhancing lessons in social studies through a culturally relevant theatrical event
- B. Creating critical consumers of theatre arts through an evaluation of historical fiction
- C. Having students use social studies skills to compare and contrast primary and secondary sources
- D. Having students recognize the influence of theatre on historical events

Answer

Option A is correct because students will have an opportunity to enrich their studies through a relevant theatrical experience. **Option B is incorrect** because the purpose is not to evaluate the performance; the students have not been instructed in how to evaluate or why they should do so. **Option C is incorrect** because there is no evidence that any primary sources (artifacts) were included in the students study or the play. **Option D is incorrect** because taking students to see the play would illustrate the influence of historical events on theatre, not the reverse.

23. Which of the following is most likely to help fourth-grade students understand the concept of characterization?

- A. Having students read and watch a variety of interviews with a noted author
- B. Having students act out the sounds and movements of various animals from a familiar story
- C. Directing students in a classroom performance of a play that is based on a familiar story
- D. Coaching individual students on the use of vocal inflection in reciting stories

Answer

Option C is correct because directing students in a classroom performance will help them understand characterization as they act out characters and actions as described by the author. **Option A is incorrect** because having students read and watch a variety of interviews with a noted author is best suited to helping students learn about that particular author's work. **Option B is incorrect** because having students act out the sounds and movements of various animals is unlikely to help them understand the concept of characterization without additional instruction. **Option D is incorrect** because coaching individual students on the use of vocal inflection is more likely to help students understand intonation than characterization.

24. While discussing a play they recently saw, students note that one of the characters often appeared onstage in the shadows. When confronted with upsetting news, the same character was shown in red light. As described, which of the following is a primary purpose of the lighting?

- A. Enhancing performance visibility
- B. Directing an actor's movement
- C. Prompting inferences about the character's personality
- D. Developing a realistic setting for the character

Answer

Option C is correct because specifically placed lighting or colored transparencies over the lights helps cue an inference regarding the character's personality. **Option A is incorrect** because while making an actor more visible is often the purpose of lighting, red light and shadows will have the opposite effect. **Option B is incorrect** because there is no evidence that the actor was being directed to move by the light. **Option D is incorrect** because the use of red light at moments when a character is receiving upsetting news helps to develop an expressionistic, rather than a realistic, effect.