

The *Praxis*® Study Companion

Pennsylvania Grades 4–8 Core Assessment

5152



Welcome to *The Praxis*® Study Companion

Prepare to Show What You Know

You have been working to acquire the knowledge and skills you need for your teaching career. Now you are ready to demonstrate your abilities by taking a *Praxis*® test.

Using the *Praxis*® Study Companion is a smart way to prepare for the test so you can do your best on test day. This guide can help keep you on track and make the most efficient use of your study time.

The Study Companion contains practical information and helpful tools, including:

- An overview of the *Praxis* tests
- Specific information on the *Praxis* test you are taking
- A template study plan
- Study topics
- Practice questions and explanations of correct answers
- Test-taking tips and strategies
- Frequently asked questions
- Links to more detailed information

So where should you start? Begin by reviewing this guide in its entirety and note those sections that you need to revisit. Then you can create your own personalized study plan and schedule based on your individual needs and how much time you have before test day.

Keep in mind that study habits are individual. There are many different ways to successfully prepare for your test. Some people study better on their own, while others prefer a group dynamic. You may have more energy early in the day, but another test taker may concentrate better in the evening. So use this guide to develop the approach that works best for you.

Your teaching career begins with preparation. Good luck!

Know What to Expect

Which tests should I take?

Each state or agency that uses the *Praxis* tests sets its own requirements for which test or tests you must take for the teaching area you wish to pursue.

Before you register for a test, confirm your state or agency's testing requirements at www.ets.org/praxis/states.

How are the *Praxis* tests given?

Praxis tests are given on computer. Other formats are available for test takers approved for accommodations (see page 79).

What should I expect when taking the test on computer?

When taking the test on computer, you can expect to be asked to provide proper identification at the test center. Once admitted, you will be given the opportunity to learn how the computer interface works (how to answer questions, how to skip questions, how to go back to questions you skipped, etc.) before the testing time begins. Watch the [What to Expect on Test Day](#) video to see what the experience is like.

Where and when are the *Praxis* tests offered?

You can select the test center that is most convenient for you. The *Praxis* tests are administered through an international network of test centers, which includes Prometric® Testing Centers, some universities, and other locations throughout the world.

Testing schedules may differ, so see the *Praxis* web site for more detailed test registration information at www.ets.org/praxis/register.

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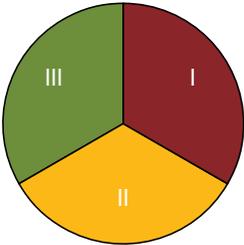
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1. Learn About Your Test

Learn about the specific test you will be taking

Pennsylvania Grades 4–8 Core Assessment (5152)

Test at a Glance			
Test Name	Pennsylvania Grades 4-8 Core Assessment		
Test Code	5152		
Time	3 hours and 30 minutes		
Number of Questions	210		
Format	Selected-response questions; scientific or four-function calculator use permitted for Mathematics and Science test		
Test Delivery	Computer delivered		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Examination
	I. Pedagogy (5153)	70	33 $\frac{1}{3}$ %
	II. English Language Arts and Social Studies (5154)	70	33 $\frac{1}{3}$ %
	III. Mathematics and Science (5155)	70	33 $\frac{1}{3}$ %

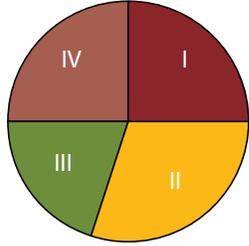
About This Test

The purpose of the Pennsylvania Grades 4–8 Core Assessment test is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary, and needed at time of entry to the profession in order to teach English, mathematics, social studies, and science.

Scientific or four-function calculator use is permitted for the Mathematics and Science test.

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

Pennsylvania Grades 4–8 Core Assessment: Pedagogy (5153)

Test at a Glance			
Test Name	Pennsylvania Grades 4-8 Core Assessment: Pedagogy		
Test Code	5153		
Time	1 hour and 10 minutes		
Number of Questions	70		
Format	Selected-response questions		
Test Delivery	Computer delivered		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Examination
	I. Adolescents as Learners II. Curriculum and Instruction III. Assessment IV. Professionalism	18 21 14 17	25% 30% 20% 25%

About This Test

The purpose of the Pedagogy test is to assess whether the entry-level middle school teacher has the general pedagogical knowledge that is important, necessary, and needed at time of entry to the profession in order to teach English, mathematics, social studies, and science.

The test is aligned to the Pennsylvania Academic Standards. The pedagogy section measures examinee's skills and knowledge of concepts relevant to adolescents as learners, planning and delivering instruction, assessing student learning, and educators as professionals.

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

Test Specifications

Test specifications describe the knowledge and skills measured by the test. Study topics to help you prepare to answer test questions can be found on page 57.

I. Adolescents as Learners

A. Adolescents' Development and the Learning Process

1. Understands how young adolescents learn
 - a. explains how knowledge is constructed, organized, integrated, and applied
 - b. applies knowledge of the learning process to instruction and assessment planning
2. Understands the distinguishing characteristics of young adolescent development
 - a. describes the developmental characteristics of each domain of adolescent development
 - intellectual
 - physical
 - psychological
 - social
 - moral and ethical
 - b. recognizes typical and atypical variance within each domain of adolescent development
3. Knows the major contributions of foundational theorists to education
 - a. relates the work of theorists to educational contexts
 - Bruner (cognitivism)
 - Piaget (stages of cognition)
 - Bloom (levels of cognition)
 - Marzano/Pickering (research-based instruction)
 - McTighe (big idea, assessment)
 - Gardner (theory of multiple intelligences)
 - Vygotsky (social learning theory)
 - Maslow (hierarchy of needs)
 - Erickson (emotional learning)
4. Knows the terminology related to learning theories
 - a. explains and provides examples of (including, but not limited to)
 - metacognition
 - schema
 - transfer
 - self-efficacy
 - constructivism
 - self-regulation
 - zone of proximal development
 - multiple intelligences
 - assimilation, accommodation, adaptation
5. Understands how learning theory impacts the instructional process for adolescents
 - a. defines the relationship between learning theory and adolescent development
 - b. provides examples of how learning is impacted
 - c. applies knowledge of the learning theory to solve educational problems

B. Adolescents as Diverse Learners

1. Understands variables that affect how adolescent students learn
 - a. describes the variables that affect how adolescents learn and perform (including, but not limited to)
 - learning style
 - gender
 - ethnicity
 - health and sexuality
 - socioeconomic status
 - religion
 - family
 - community
 - peer groups
 - society
 - prior knowledge and experience
 - motivation
 - self-confidence/self-esteem
 - cognitive development
 - maturity
 - language
 - expectations for learning
 - behavior
 - b. provides examples of how variables may affect how adolescents learn and perform
2. Understands the impact of individual differences on adolescent learning
 - a. defines areas of exceptionality
 - cognitive
 - auditory
 - visual
 - motor/physical
 - speech/language
 - social/emotional
 - behavioral
 - b. explains how exceptionalities may impact adolescent learning
3. Understands how legislation relating to students with special needs impacts classroom practice
 - a. identifies the provisions of legislation relevant to adolescents with exceptionalities
 - Americans with Disabilities Act (ADA)
 - Individuals with Disabilities Education Act (IDEA)
 - PA Chapter 14 and Chapter 16
 - Section 504, Rehabilitation Act

- b. explains how the provisions of legislation affect classroom practice
 - adaptations
 - modifications
 - inclusion
 - documentation
 - accommodations
4. Is familiar with the traits, behaviors, and needs of students with special needs
 - a. identifies the traits, behaviors, and needs of students with special needs
 - cognitive disability (ADD, ADHD, autism spectrum, dyslexia)
 - emotional disability
 - learning disability
 - physical disability
 - gifted
5. Knows how the process of English language acquisition affects the educational experiences of adolescent English Language Learners
 - a. recognizes how the process of English language acquisition affects the educational experiences of adolescent English Language Learners
6. Is familiar with the effect of culture and gender on communication
 - a. recognizes the impact of culture on students' verbal and nonverbal communication
 - b. recognizes the impact of gender on students' verbal and nonverbal communication

C. Student Motivation and the Learning Environment

1. Understands the implications of foundational motivation theories for instruction, learning, and classroom management
 - a. describes terms related to foundational motivation theories
 - self-determination
 - attribution
 - extrinsic/intrinsic
 - cognitive dissonance
 - student engagement
 - positive and negative reinforcement
 - b. relates motivation theories to instruction, learning, and classroom management

2. Understands research-based strategies for classroom management
 - a. applies methods for developing classroom routines, procedures, and standards of conduct
 - b. applies methods for maintaining accurate records
 - c. applies methods for arranging classroom space
 3. Understands strategies for establishing a positive, respectful, and nurturing learning environment
 - a. applies methods for developing a positive classroom environment
 - b. applies strategies to develop a learning community that respects the diversity of students
 4. Knows strategies to support the development of motivation in young adolescents
 - a. identifies strategies for helping adolescents develop self-motivation
 - assigning purposeful and meaningful tasks
 - providing frequent feedback
 - including students in classroom and instructional decisions
2. Knows how to apply the basic concepts of educational theories when planning instruction
 - a. describes and applies concepts of:
 - cognitivism (schema, information processing, mapping)
 - social learning theory (modeling, reciprocal processing)
 - constructivism (learning as experience, problem-based learning, scaffolding, inquiry)
 - behaviorism (conditioning, intrinsic/extrinsic rewards, positive and negative reinforcement, punishment)
 - strategic learning (student-centered)
 3. Knows the effect of scope and sequence on instructional planning
 - a. defines and provides examples of scope
 - b. defines and provides examples of sequence
 - c. describes the relationship between scope and sequence and standards of learning
 4. Knows the integrative nature of subject matter
 - a. identifies the connections among subject matter disciplines and the implications for student learning

II. Curriculum and Instruction

A. Planning Instruction

1. Understands how the national and state content standards impact planning for instruction
 - a. explains how standards inform instructional planning
 - b. utilizes resources for implementing standards-aligned instruction
 - Common Core State Standards
 - PA Academic Standards
 - PA State Assessment Anchors 3–8
 - PDE Standards Aligned System
 - Professional Content Standards
5. Understands how to select content to achieve unit and lesson objectives
 - a. selects content at the appropriate level of difficulty to achieve lesson and unit objectives
6. Knows how to develop instructional objectives
 - a. distinguishes among the different learning domains
 - cognitive
 - affective
 - psychomotor
 - b. applies the different learning domains to developing instructional objectives

7. Understands the role of resources and materials in planning instruction
 - a. identifies and explains the use of resources and materials to support learning (including, but not limited to)
 - library collection
 - videos
 - artifacts, models, manipulatives
 - adaptive and assistive technology
 - guest speakers
 - b. integrates technology in planning and lesson delivery
 - technological devices
 - Internet
 - electronic resources

8. Knows how to access and utilize various resources to meet adolescents' diverse learning needs
 - a. identifies resources to address the varied needs of young adolescent students
 - b. selects resources to address the differentiated needs of young adolescents

9. Is familiar with how to develop lessons as part of thematic, integrative, specific, and/or interdisciplinary units
 - a. identifies the basic concepts of thematic instruction
 - b. identifies the components of thematic units (theme, learning activities, resources, assessments)
 - c. identifies the basic concepts of integrative/interdisciplinary units
 - d. identifies the process for integrative/interdisciplinary unit development
 - collaborating
 - generating applicable topics
 - developing a framework
 - identifying goals
 - developing assessments, instructional activities, and resources

10. Knows collaborative processes for instructional planning
 - a. identifies instructional planning partners
 - grade-level team members
 - specialist subject-area teachers (art, music, physical education, technology education, family and consumer sciences)
 - library media specialist
 - teachers of students with special needs
 - instructional coaches
 - paraeducators
 - stakeholders
 - b. describes the role partners play in instructional planning

11. Knows short- and long-term planning techniques
 - a. describes lesson, unit, term, semester, and year-long planning
 - b. describes the importance of benchmarks in the planning process

12. Understands how to plan instruction based on adolescents' prior knowledge
 - a. describes strategies for activating students' prior knowledge
 - b. utilizes students' prior knowledge to plan instruction

B. Instructional Strategies

1. Understands the distinguishing characteristics of instructional models to support young adolescent learning
 - a. describes the distinguishing characteristics of instructional models
 - direct instruction
 - indirect instruction
 - independent instruction
 - experiential and virtual
 - interactive

- b. identifies instructional strategies associated with each model
 - direct instruction (explicit teaching, drill and practice, lecture, demonstrations, guides for reading, writing, viewing)
 - indirect instruction (problem solving, inquiry, case studies, concept mapping, reading for meaning, cloze procedures)
 - independent (learning contracts, research projects, learning centers, computer-mediated, distance learning)
 - experiential (field trips, experiments, simulations, role play, games, observations)
 - interactive (brainstorming, cooperative learning groups, interview, discussions, peer practice, debates)
 - c. selects the appropriate instructional model to achieve a learning objective
2. Knows strategies to encourage complex cognitive processes
- a. identifies complex cognitive processes (including, but not limited to)
 - concept learning
 - problem solving
 - metacognition
 - critical thinking
 - creative thinking
 - transfer of learning
 - b. identifies instructional activities specific to the development of complex cognitive processes (including, but not limited to)
 - distinguishing fact from opinion
 - comparing
 - detecting bias
 - predicting
 - categorizing
 - analyzing
 - sequencing
 - summarizing
 - inferring
 - decision making
 - evaluating
3. Knows strategies to promote young adolescents' development of self-regulatory skills
- a. identifies and describes uses of strategies to support adolescents' learning and behaviors (including, but not limited to)
 - modeling
 - independent practice
 - scaffolding
 - differentiating
 - guided practice
 - peer tutoring
 - intervention
 - mediation
4. Knows the advantages and disadvantages of different group configurations for learning
- a. selects group configurations based on learning objectives
 - whole class
 - small group
 - independent
 - one on one
 - pairs/triads/quads
 - b. describes the advantages and disadvantages of specific grouping choices
 - heterogeneous grouping (gender, interest, ability)
 - homogeneous grouping (gender, interest, ability)
5. Knows how to teach to an instructional objective
- a. describes how to teach to an objective
 - b. selects questions, responses, activities, and information that are aligned to the objectives
6. Knows how to monitor and adjust instruction in response to student feedback
- a. identifies the purpose of monitoring the learning and adjusting the teaching
 - b. describes strategies to monitor learning and adjust instruction
7. Knows the role of teachable moments in instruction
- a. defines a teachable moment
 - b. describes the impact of teachable moments on learning

8. Knows strategies for reflecting upon, analyzing, and evaluating the effectiveness of instruction
 - a. describes reflective practice
 - b. uses reflective strategies to inform instructional decisions
9. Knows research-based questioning techniques
 - a. describes how the techniques are important for student learning
 - b. describes questioning strategies (including, but not limited to)
 - ascending or progressing questioning (Bloom’s)
 - Socratic method
 - question, answer, relationship (QAR)
 - study, question, read, recite, review (SQ3R)
10. Knows questioning techniques for a variety of purposes
 - a. identifies questioning and response strategies (including, but not limited to)
 - helping students articulate ideas
 - motivating students to engage in discussion
 - determining prior knowledge
 - preparing students for what is to be learned
 - evaluating students’ preparation
 - reviewing previous lessons
 - guiding students’ thinking
 - developing critical and creative thinking skills
 - checking for understanding
 - summarizing information
 - stimulating students’ to pursue knowledge on their own
 - validating responses

C. Communication Techniques

1. Knows verbal and nonverbal communication techniques (including, but not limited to)
 - a. verbal communication techniques
 - volume
 - tone
 - b. nonverbal communication techniques
 - eye contact
 - cues
 - body language
 - gestures
 - proximity
2. Knows research-based techniques to promote communication
 - a. identifies activities that promote communication
 - class meetings
 - oral presentations
 - peer feedback
 - b. selects tools that support communication
 - visuals
 - words wall
 - K-W-L chart
 - c. identifies active listening strategies
 - attending to the speaker
 - restating key points
 - asking questions
 - interpreting information
 - providing support feedback
 - being respectful
 - d. defines the effect of active listening on communication
3. Knows various instructional strategies to support literacy development across the curriculum
 - a. identifies strategies to support students’ understanding of text structure
 - b. identifies strategies to support students’ comprehension of text
 - c. identifies strategies to support students’ acquisition of vocabulary
 - d. identifies strategies to help students’ acquire and integrate knowledge

III. Assessment

A. Types of Assessment

1. Understands the distinctions among different forms of assessment
 - a. identifies different forms of assessment (including, but not limited to)
 - traditional
 - authentic
 - portfolio
 - exhibition
 - open-ended
 - alternative
 - standardized
2. Knows the role of formal and informal assessments to guide instruction
 - a. defines uses of formal and informal assessment
 - b. identifies ways formal and informal assessment results are used to guide instructional decision making
3. Is familiar with the different purposes of standardized tests
 - a. describes
 - achievement tests
 - aptitude tests
 - ability tests
 - b. identifies the data derived from different types of standardized tests
4. Is familiar with the difference between norm-referenced and criterion-referenced tests
 - a. identifies the uses of norm-referenced and criterion-referenced tests
 - b. identifies the data provided by a norm-referenced and a criterion-referenced test.
5. Knows the rationale for using student self- and peer assessment
 - a. identifies the purpose of student self-assessment
 - b. identifies the purpose of peer assessment

B. Assessment Data

1. Knows the concept of data-informed decision making
 - a. defines the concept of data-informed decision making and its value for teaching and learning
2. Knows how to communicate the meaning of assessment results
 - a. describes what scores and testing data indicate about a student's ability, aptitude, or performance
 - b. explains assessment results in terms appropriate for a specific audience

C. Assessment Design and Tools

1. Knows design of assessments that target standards and academic anchors in subject areas
 - a. describes a variety of assessment formats (including, but not limited to)
 - essay
 - selected response
 - portfolio
 - conference
 - observation
 - performance
2. Is familiar with the terminology related to scoring
 - a. defines
 - raw score
 - scaled score
 - percentile
 - grade-equivalent scores
 - age-equivalent scores
 - holistic scoring
 - analytic scoring
3. Knows how to select assessments to measure student mastery of learning goals and objectives
 - a. identifies a variety of assessment tools, their uses, strengths, and limitations
 - rubrics
 - analytic checklists
 - scoring guides
 - anecdotal notes
 - continuums
 - technology
 - b. selects an appropriate assessment to measure learning

IV. Professionalism

A. Philosophy and Organization

1. Understands the rationale and purpose of middle level schooling
 - a. describes the historical and contemporary models of schooling for young adolescents
 - b. describes the advantages and disadvantages of historical and contemporary models of schooling for young adolescents
2. Understands middle level philosophy
 - a. defines the philosophical foundation of developmentally responsive middle level programs and schools
3. Knows middle level trends and issues
 - a. identifies trends and issues affecting middle level education
 - social (bullying, social networking, sexting, peer pressure)
 - economic (transient students due to job loss, socioeconomic status)
 - political (budget cuts, school vouchers, private schools)
4. Knows the organizational features of middle level schools
 - a. defines the characteristics of developmentally responsive middle level schools (team teaching, advisories, teams, flexible schedule)
 - b. defines the rationale for the characteristic of developmentally responsive middle level schools
5. Understands developmentally responsive middle level school practices
 - a. explains how best practices meet the needs of young adolescents
 - exploratory
 - interest/mini-courses
 - intramurals
 - flexible grouping
 - interdisciplinary curriculum
 - transitional planning
 - blended learning

B. Professional Development

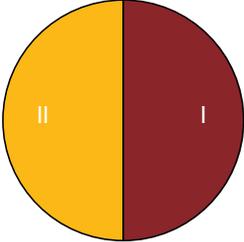
1. Is familiar with a variety of professional development practices and resources
 - a. identifies the purpose of (including, but not limited to)
 - professional literature
 - professional associations
 - workshops
 - conferences
 - learning communities
 - graduate courses
 - independent research
 - induction programs
 - study groups
 - webinars
2. Is familiar with research on curriculum, assessment, and instruction
 - a. identifies how research informs educational practices
3. Understands the value of reflective practice for professional growth
 - a. identifies the purpose of reflective practice
 - b. identifies activities to support reflective practice
 - journal writing
 - self-assessment
 - peer assessment
 - action research
 - peer observation
 - portfolio

C. Professional Practices

1. Knows the implications of federal, state, and local legislation on education
 - a. defines the implications of major legislation and court decisions relating to students and teachers
 - equal access
 - Family Educational Rights and Privacy Act
 - First Amendment issues
 - intellectual freedom
 - child neglect and abuse reporting
 - due process
 - liability
 - licensing and tenure
 - copyright
 - student assistance program

2. Knows the roles of teachers as educational leaders in the greater community
 - a. identifies ways educators shape and advocate for the profession
 - serving as role models
 - establishing relationships with parents/guardians, family members, and members of the community
 - establishing partnerships with the community
3. Knows the value of and strategies for developing collaborative relationships to support the education process
 - a. identifies stakeholders
 - colleagues
 - administrators
 - other school personnel
 - parents/guardians
 - community members
 - b. defines elements of successful collaboration
 - identifying stakeholders
 - identifying the purpose and benefits of collaboration
 - developing an action plan
 - supporting effective communication

Pennsylvania Grades 4–8 Core Assessment: English Language Arts and Social Studies (5154)

Test at a Glance			
Test Name	Pennsylvania Grades 4-8 Core Assessment: English Language Arts and Social Studies		
Test Code	5154		
Time	1 hour and 10 minutes		
Number of Questions	70		
Format	Selected-response questions		
Test Delivery	Computer delivered		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Examination
	I. English Language Arts	35	50%
	II. Social Studies	35	50%

About This Test

The purpose of the English Language Arts and Social Studies test is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary, and needed at time of entry to the profession in order to teach English and social studies.

The test is aligned to the Pennsylvania Academic Standards for English Language Arts and Social Studies. The English Language Arts section measures test takers' skills and knowledge of concepts relevant to two content categories: reading and writing. The Social Studies section measures test takers' skills and knowledge of concepts relevant to five content categories: United States History, World History, Government and Political Science, Geography, and Economics.

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

Test Specifications

Test specifications describe the knowledge and skills measured by the test. Study topics to help you prepare to answer test questions can be found on page 63.

I. English Language Arts

A. Reading

1. Informational text (print and other media)
 - a. understands how to interpret informational texts
 - comprehend the literal meaning of a passage
 - draw inferences from a passage
 - summarize or paraphrase the main idea(s) and supporting details within a passage
 - compare and contrast two or more texts
 - analyze text features (e.g., headings, charts, sidebars)
 - distinguish among forms of text organization (e.g., cause and effect, sequential order, problem-solution)
 - b. understands the use of critical thinking in informational text
 - differentiate between facts and opinions
 - identify biases, fallacies, stereotypes, and assumptions
 - explain how biases, fallacies, stereotypes, and assumptions can affect intended meaning
 - identify propaganda techniques (e.g., bandwagon, emotional appeal, testimonial) in informational texts
2. Literature
 - a. understands how to interpret literature
 - comprehend the literal meaning of a passage
 - draw inferences from a passage
 - summarize or paraphrase the main idea(s) and supporting details within a passage
 - identify theme(s) in a passage
 - compare and contrast two or more texts within and across genres
 - identify literary elements (e.g., setting, plot, characterization)

- b. knows major literary genres
 - describe the characteristics of each major literary genre (e.g., poetry, fiction, drama)
- c. understands figurative language
 - explain the major types of figurative language (e.g., simile, metaphor, personification)
 - interpret figurative language used within a text

B. Writing

1. Types of writing
 - a. understands the use of different types of writing
 - describe and differentiate among the types of writing (e.g., narrative, persuasive, informational)
 - determine when to use each type of writing
 - b. knows the author's purpose and role of the audience
 - identify the author's purpose
 - identify the intended audience of a work
 - determine when to use formal versus informal language
2. Quality of writing
 - a. understands the domain of organization
 - describe organization within and across paragraphs
 - identify examples of organizational features in writing (e.g., appropriate transitions, introduction, body, conclusion)
 - b. understands the domains of content and focus
 - identify a thesis statement within a text
 - identify evidence supporting the thesis within a text
 - evaluate a text's thesis and support to ensure logical connections

- c. understands the domain of conventions
 - apply standard use of capitalization and punctuation
 - apply standard English usage (e.g., subject-verb agreement, pronoun agreement, tense consistency)
 - identify complete sentences
- 3. Writing process
 - a. knows common approaches to composition
 - describe the stages of the writing process (e.g., planning, drafting, editing)
 - apply revision techniques
- 4. Research
 - a. knows common research techniques
 - identify relevant information from multiple print and non-print sources
 - determine the credibility and accuracy of source materials
 - differentiate between primary and secondary sources
 - identify documentation techniques when quoting or paraphrasing source materials to avoid plagiarism
 - identify parts of a bibliographic citation
- e. knows basic tenets of the Declaration of Independence
- f. demonstrates knowledge of the early government of the United States prior to the Constitution
- 3. Is familiar with major political developments throughout United States history
 - a. is familiar with
 - development of political parties
 - Jacksonian era
 - Gilded Age
 - Progressive era
 - New Deal
 - political issues of the 1940-90s (e.g., McCarthyism, Civil Rights movements, student protest movements, Watergate)
- 4. Knows about nineteenth-century sectionalism, the Civil War, and Reconstruction
 - a. demonstrates knowledge of
 - economic and cultural divide between the North and the South
 - events leading to the Civil War
 - b. identifies leaders and major turning points of the Civil War
 - c. knows major causes and effects of Reconstruction
- 5. Knows the impact of racial, gender, and ethnic interactions throughout United States history
 - a. demonstrates knowledge of racial issues throughout United States history (e.g., slavery, Japanese internment, struggles for civil rights)
 - b. demonstrates knowledge of gender issues throughout United States history (e.g., woman suffrage, feminist movement)
 - c. demonstrates knowledge of key individuals in struggles for civil rights (e.g., Elizabeth Cady Stanton, Martin Luther King, Jr., Cesar Chávez)

V. Social Studies

A. United States History

- 1. Knows basic North American geography and the peoples and cultures of North America prior to European colonization
 - a. locates major geographical features (e.g., mountain ranges, lakes, rivers, valleys)
 - b. knows differences in climate and vegetation across the regions
 - c. describes major features of various Indian groups (e.g., Eastern Woodlands, Great Plains)
- 2. Knows the origins and development of the 13 colonies and the early Republic
 - a. identifies reasons for settlement
 - b. describes the evolution of the English colonies
 - c. knows the causes and results of the American Revolution
 - d. identifies leaders and major turning points of the American Revolution

6. Knows major cultural and social developments in United States history
 - a. knows about
 - social reform and educational reform movements (e.g., abolitionism, temperance)
 - religious movements (e.g., Second Great Awakening)
 - industrialization and urbanization
 - major social and cultural trends of the twentieth century (e.g., counterculture, consumerism)
 - the impact of changing roles of women, men, and the family in United States history
 7. Knows about territorial expansion and the emergence of the United States as a world power
 - a. demonstrates knowledge of western acquisitions (e.g., Louisiana Purchase)
 - b. demonstrates knowledge of military actions (e.g., Spanish-American War, First and Second World Wars)
 8. Knows major economic transformations (e.g., in agriculture, in business, and in labor) in the United States
 - a. demonstrates knowledge of economic cycles of boom and bust in United States history
 - b. demonstrates knowledge of the long-term changes from an agricultural economy to an industrial economy to a post-industrial economy in United States history
 9. Knows changing patterns of immigration to the United States and internal migration within the United States
 - a. demonstrates knowledge of major shifts in the sources of immigration to the United States
 - b. demonstrates knowledge of the impact of immigration to and migration within the United States
 10. Knows the interpretations and ongoing impact of the United States Constitution
 - a. is familiar with landmark Supreme Court cases
 - Dred Scott case (*Dred Scott v. Sandford*)
 - *Brown v. Board of Education of Topeka*
 - *Marbury v. Madison*
 - *Miranda v. Arizona*
 - b. demonstrates knowledge of the Constitution and Bill of Rights
 11. Knows major developments of Pennsylvania history
 - a. knows major social, political, cultural, and economic developments throughout Pennsylvania history
 - b. knows major historical figures and their contributions to Pennsylvania history until 1824 (e.g., William Penn, Benjamin Franklin)
 - c. knows major historical sites in Pennsylvania (e.g., Gettysburg, Philadelphia, Pittsburgh)
 - d. is familiar with the history of Pennsylvania's ethnic groups
- B. World History**
1. Is familiar with the major contributions of early civilizations in Africa, Europe, Asia, and the Americas, such as long-term impact on science, philosophy, art, religion, and governance
 - a. is familiar with the contributions of early river valley civilizations (e.g., Egyptian, Mesopotamian, Chinese Dynasties)
 - b. is familiar with contributions of major civilizations in the Americas (e.g., Aztecs, Incas, Mayans)
 2. Is familiar with the major contributions of the classical civilizations of Greece and Rome
 3. Is familiar with growing global interactions in the period 1200 to 1900 C.E.
 - a. is familiar with the global transition to a market economy
 - b. is familiar with cultural contacts among Europe, Asia, Africa, and the Americas (e.g., Columbian Exchange, colonization, the Plague)

4. Is familiar with the causes and effects of the First World War, the Second World War, and the Cold War (e.g., Russian Revolution, decolonization)
5. Is familiar with globalization
 - a. identifies examples of globalization
6. Is familiar with how technological innovations have shaped world societies
 - a. is familiar with the development and diffusion of long-range communication, transportation, and tools
7. Is familiar with basic tenets of major world religions
 - a. is familiar with major world religions (e.g., Hinduism, Buddhism, Islam, Christianity, Judaism)
8. Is familiar with major economic transformations that have affected world societies (e.g., spread of the market economy, industrialization)
 - a. is familiar with how industrialization has affected world societies since the Industrial Revolution
 - b. is familiar with how the spread of the market economy has affected world societies
9. Is familiar with major demographic trends in world history
 - a. is familiar with how the development of agriculture has impacted demographic trends
 - b. is familiar with the demographic effects of industrialization and urbanization

C. Government/Political Science

1. Knows the key concepts and ideas on which the United States government is based
 - a. demonstrates knowledge of how key concepts (e.g., popular sovereignty, separation of powers, checks and balances) shaped the framing of the Constitution and the United States government
2. Knows about federalism and the basic relationship between the states and the national government
 - a. defines federalism and its impact on governance in the United States
 - b. demonstrates knowledge of the relationships among federal and state governments
3. Knows the roles and interactions of the three branches of the federal government
 - a. demonstrates knowledge of the functions and powers of the legislative, executive, and judicial branches of government
 - b. demonstrates knowledge of the relationships among the legislative, executive, and judicial branches of government
4. Knows how the election process operates in the United States
 - a. demonstrates knowledge of the Electoral College and its role in elections (e.g., the role of the popular vote)
 - b. demonstrates knowledge of characteristics of the election process (e.g., nominating, campaigning, fundraising)
5. Knows the rights, responsibilities, and duties of citizens
 - a. demonstrates knowledge of civic participation (e.g., community service, membership in civic organizations)
 - b. demonstrates knowledge of the rights and responsibilities (e.g., petition, voting, paying taxes) of United States citizens
 - c. demonstrates knowledge of the application of constitutional rights in American society (e.g., free speech)
6. Is familiar with the basic characteristics of major political systems
 - a. is familiar with the structure of differing political systems (e.g., democracy, monarchy, theocracy)

7. Knows about Pennsylvania state government
 - a. knows the principles, structure, and operation of Pennsylvania state government

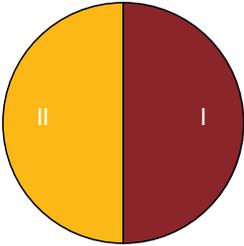
D. Economics

1. Is familiar with the basic principles of economics
 - a. defines economics
 - b. is familiar with basic economic principles (e.g., scarcity, choice, competition, allocation of resources, supply and demand)
2. Is familiar with basic principles of personal finance
 - a. is familiar with the principles of budgeting, credit, and savings
 - b. is familiar with basic investment tools (e.g., stocks and bonds)
3. Is familiar with how the factors of production affect economic activity
 - a. is familiar with how the factors of production (i.e., land, labor, capital, and entrepreneurship) affect economic activity

E. Geography

1. Is familiar with spatial patterns and their meanings (e.g., population density, resource distribution)
 - a. recognizes spatial patterns (e.g., of people, of places, and of environments)
 - b. describes patterns at any given scale
2. Is familiar with the use of characteristics (e.g., climate, location, culture) to identify regions
 - a. is familiar with the creation and uses of regions to interpret Earth's complexity (e.g., rain forest, Africa, Middle East)
 - b. identifies regions based on cultural and physical characteristics
3. Knows the interaction between the environment and human activity
 - a. demonstrates knowledge of how human actions modify the physical environment
 - b. demonstrates knowledge of how physical environments affect human activities (e.g., transportation systems, communication systems, trade)
4. Understands the concepts of absolute and relative location
 - a. demonstrates an understanding of latitude and longitude and applies them to determine absolute location on a map
 - b. demonstrates understanding of and ability to use the concepts of absolute and relative location
 - c. demonstrates understanding of cardinal and intermediate directions
5. Knows the location of prominent geographic features around the world (e.g., oceans, continents)
 - a. identifies the location of oceans, continents, major rivers, and major physical features (e.g., Amazon River, Himalayan Mountains)

Pennsylvania Grades 4–8 Core Assessment: Mathematics and Science (5155)

Test at a Glance			
Test Name	Pennsylvania Grades 4-8 Core Assessment: Mathematics and Science		
Test Code	5155		
Time	1 hour and 10 minutes		
Number of Questions	70		
Format	Selected-response questions; scientific or four-function calculator use permitted.		
Test Delivery	Computer delivered		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Examination
	I. Mathematics	35	50%
	II. Science	35	50%

About This Test

The purpose of the Mathematics and Science test is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary, and needed at time of entry to the profession in order to teach mathematics and science.

The mathematics section of the test reflects the Pennsylvania Academic Standards for Mathematics, the Pennsylvania Core Mathematics Standards, and The Framework for Grades 4-8 Program Guidelines for Pennsylvania. The mathematics section is also aligned to the National Council of Teachers of Mathematics/Council for the Accreditation of Educator Preparation (NCTM CAEP) 2012 standards.

The science section of the test reflects the Pennsylvania Academic Standards for Science and Technology and Engineering Education and the Framework for Grades 4-8 Program Guidelines for Pennsylvania. The science section is also aligned to the National Science Education Standards (NSES) and the National Science Teacher Association (NSTA) standards.

Scientific or four-function calculator use is permitted.

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

Test Specifications

Test specifications describe the knowledge and skills measured by the test. Study topics to help you prepare to answer test questions can be found on page 70.

I. Mathematics

A. Numbers and Operations

1. Understands basic operations and properties of rational numbers
 - a. solve problems involving addition, subtraction, multiplication, and division of rational numbers
 - b. apply the order of operations (e.g., $2 + 5 \times 7 = 2 + 35 = 37$)
 - c. use place value to read and write numbers in standard and expanded form
 - d. identify or apply properties of operations on a number system (i.e., commutative, associative, distributive, identity)
 - e. order positive and negative integers
 - f. perform operations involving positive exponents
2. Understands the relationships among fractions, decimals, and percents
 - a. simplify fractions to lowest terms
 - b. find equivalent fractions
 - c. convert among fractions, decimals, and percents
 - d. represent fractions, decimals, and percents with various models
 - e. compare positive rational numbers written as fractions and/or decimals
3. Knows how to use ratios and proportional relationships in solving problems
 - a. apply the concept of a ratio to describe a relationship between two quantities
 - b. given a ratio, use a proportion to solve a problem (e.g., unit rates, scale factors)
 - c. solve percent problems involving discounts, taxes, gratuities, and simple interest rates

4. Knows the basic concepts of number theory (e.g., primes, composites, factors, multiples)
 - a. apply characteristics of prime and composite numbers
 - b. apply characteristics of odd or even numbers
 - c. solve basic problems involving factors or multiples
5. Knows how to use estimation to determine the reasonableness of results
 - a. demonstrate an understanding of estimation and rounding
 - b. recognize appropriate uses of estimation and rounding

B. Algebra

1. Knows how to translate verbal relationships into algebraic expressions and equations
 - a. translate verbal relationships into algebraic expressions or equations
2. Understands how to solve equations
 - a. use variables to construct and solve equations
3. Knows how to recognize and represent simple sequences or patterns (e.g., arithmetic, geometric)
 - a. describe or extend patterns involving numbers, shapes, or figures
 - b. form rules based on given patterns
 - c. identify patterns based on given rules

C. Functions and Their Graphs

1. Understands how to evaluate functions for given input values
 - a. evaluate functions for given input values (i.e., algebraically, graphically, tabular)
2. Understands the components of the coordinate plane
 - a. identify the x -axis, the y -axis, the origin, and the four quadrants in the coordinate plane

3. Knows how to graph ordered pairs on the coordinate plane
 - a. identify and label ordered pairs on the coordinate plane
4. Knows how to analyze and create functions that model given information
 - a. determine whether particular mathematical models (i.e., graph, equation, table) match given sets of conditions

D. Geometry and Measurement

1. Knows how to solve problems involving perimeter, area, and volume
 - a. solve problems involving perimeter of polygons
 - b. solve problems involving area of triangles, quadrilaterals, and polygons composed of triangles and quadrilaterals
 - c. solve problems involving volume of cubes and rectangular prisms
 - d. use correct labels for dimensions in problems involving perimeter, area, and volume
2. Is familiar with similarity and congruence
 - a. use similarity to solve problems with polygons
 - b. use congruence to solve problems with polygons
3. Knows how to solve problems involving circles
 - a. solve problems involving circumference and area of circles
 - b. solve problems involving diameter and radius of circles
4. Knows properties of polygons
 - a. solve problems involving triangles (e.g., isosceles, equilateral, right)
 - b. identify geometric properties of various quadrilaterals (e.g., parallelogram, trapezoid)
 - c. identify relationships among quadrilaterals
 - d. interpret and solve problems involving transformations (i.e., translations, reflections, rotations) on the coordinate plane
 - e. identify the lines of symmetry in a polygon

5. Knows properties of and relationships among points, lines, line segments, and rays
 - a. identify points, lines, line segments, and rays
 - b. identify parallel and perpendicular lines
6. Understands systems of measurement
 - a. solve measurement and estimation problems involving time, length, volume, and mass in both United States customary and metric systems
 - b. convert units within the United States customary system or the metric system
 - c. use appropriate units of measurement in a given context

E. Probability, Statistics, and Discrete Math

1. Understands basic computations in statistics (i.e., mean, median, mode, range)
 - a. determine the mean, median, mode, and range of a given data set
 - b. choose an appropriate measure of central tendency to represent a given data set
2. Knows how to analyze and interpret data presented in tables, charts, and graphs
 - a. analyze and interpret bar graphs, line graphs, circle graphs, pictographs, tables, charts, and tallies
 - b. identify outliers in a data set
3. Knows how to determine the probability of simple events
 - a. find experimental probabilities using data collections, experiments, and simulations
 - b. find theoretical probabilities of simple events
4. Is familiar with logical reasoning
 - a. determine the truth of if-then statements
 - b. use if-then statements to construct simple valid arguments
 - c. draw inductive and deductive conclusions within mathematical contexts

II. Science

A. Scientific Inquiry, Methodology, Techniques, and History

1. Elements of scientific inquiry and how they are used
 - a. identify observations, hypotheses, experiments, conclusions, theories, and models
 - b. critique basic experimental design and identify variables, controls, and sources of error
 - c. describe the nature of scientific knowledge (e.g., subject to change, consistent with evidence, a human endeavor)
 - d. identify unifying concepts and processes (e.g., systems, models, constancy and change, equilibrium, form and function)
2. Common methods and tools used to gather reliable data
 - a. appropriate use of common tools, such as thermometers, microscopes, barometers, and graduated cylinders
 - b. basic scientific units of measurement, such as length, distance, time, mass, volume, and temperature scales
 - c. common prefixes for measurement units, such as milli- or kilo-
3. Interpretation of scientific data presented in various forms (e.g., tables, graphs, maps, charts)
 - a. recognize patterns
 - b. draw basic conclusions
 - c. make predictions
 - d. identify significant points or regions on graphs
4. Important scientific developments and the contributions of major historical figures
 - a. identify major historical figures who contributed to the development of current scientific knowledge (e.g., Darwin, Newton, Galileo)

B. Physical Sciences

1. Basic relationships between energy and matter
 - a. conservation of matter in chemical processes and phase changes
 - b. conservation of energy and energy transformations (e.g., potential to kinetic, light to heat)
 - c. different forms of energy, such as kinetic, potential, thermal, light, and electrical
 - d. heat transfer by conduction, radiation, and convection
 - e. properties of solids, liquids, and gases
 - f. changes of state in matter, such as melting, evaporating, and condensing
2. Basic concepts of chemistry
 - a. basic atomic structure, including nucleus, protons, electrons, and neutrons
 - b. identify physical properties of substances, such as density, melting points, ability to conduct heat, and ability to conduct electricity
 - c. chemical versus physical changes (e.g., iron rusting, water boiling)
 - d. common examples of chemical reactions in everyday life, such as baking, batteries, and matches burning
 - e. distinguish between elements (e.g., carbon) and compounds (e.g., carbon dioxide)
 - f. basic characteristics of acids and bases, and the pH scale
 - g. solubility of common substances (e.g., salt in water, oil in water)
3. Basic concepts of physics
 - a. the effect of forces acting on objects
 - b. motion described in terms of distance traveled, time, speed, and acceleration
 - c. gravity and weight (e.g., force of gravity, difference between mass and weight)
 - d. characteristics of magnets (e.g., magnetic poles, attraction, repulsion)
 - e. attraction and repulsion of electric charges
 - f. electricity (e.g., electric current is the flow of electrons)
 - g. light and sound (e.g., waves, reflection, color, spectrum, pitch, echoes)

C. Life Sciences

1. Cell structure and function
 - a. basic cell structures and their function (e.g., nucleus, cell membrane)
 - b. cellular processes, such as cell division and photosynthesis
 - c. common types of biological molecules, such as proteins, fats, and carbohydrates
2. Genetics and evolution
 - a. simple genetics involving dominant and recessive alleles (e.g., relationship between genes and traits)
 - b. common human genetic disorders
 - c. basic structure of DNA and its relationship to genes
 - d. identify processes by which species change over time, including natural selection, mutation, and evolution
3. Diversity of life
 - a. classification systems (e.g., kingdom, genus, species)
 - b. general characteristics of common types of organisms (e.g., amphibians, reptiles, mammals, plants, mushrooms, bacteria)
 - c. basic structure and function of the human body (e.g., the heart and circulatory system, stomach and digestive system)
4. Ecology
 - a. types and components of ecosystems (e.g., food webs, energy levels, biomes)
 - b. causes of population changes (e.g., naturally occurring diseases, human activity)
 - c. relationships between species, such as predator-prey relationships

D. Earth and Space Sciences

1. Physical and historical geology
 - a. Earth's basic structure (e.g., rocks, crust, mantle, core)
 - b. plate tectonics, volcanoes, and earthquakes
 - c. weathering, erosion, and deposition
 - d. the water cycle
 - e. fossil formation and early history of Earth

2. Earth's hydrosphere and atmosphere
 - a. basic oceanography, including tides, currents, and ocean floor features
 - b. polar ice caps, icebergs, and glaciers
 - c. freshwater (e.g., lakes, rivers, streams, groundwater)
 - d. basic concepts of weather and climate, including the atmosphere, clouds, and precipitation
3. Astronomy
 - a. basic components of the solar system, including the Sun, planets, moons, asteroids, and comets
 - b. phases of the Moon and lunar and solar eclipses
 - c. causes of the seasons
 - d. major features of the universe, including stars, galaxies, and black holes

E. Science, Technology, and Society

1. The impact of science, technology, and human activity on the environment
 - a. greenhouse gases, air and water pollution, acid rain, and ozone layer depletion
 - b. global climate and sea level change
 - c. issues arising in areas, such as trash disposal and use of herbicides and insecticides
2. The major issues associated with energy production and the management of natural resources
 - a. identify the benefits of conservation and recycling
 - b. distinguish between renewable and nonrenewable resources
 - c. pros and cons of energy production based on various sources (e.g., fossil, nuclear, water, wind, solar, biomass, geothermal)
 - d. use and extraction of Earth's resources (e.g., mining, reclamation, deforestation)

3. Applications of science and technology in daily life
 - a. identify some basic chemical properties of household products (e.g., acids and bases, such as orange juice and ammonia-based cleaning solvents)
 - b. identify basic physical processes in devices, such as batteries, lenses, wireless devices, and communication satellites
 - c. recognize the contributions of space technology (e.g., communication and navigation systems)
 - d. identify common agricultural practices (e.g., genetically modified crops, use of herbicides and insecticides, use of antibiotics) and their impact
 - e. use of DNA evidence in forensic investigations

4. The impact of science on public health issues and medical technology
 - a. nutrition, medicine, disease, genetic disorders, and health
 - b. identify the purpose of medical technologies, such as MRIs and X-rays
 - c. identify the impact of biotechnologies

2. Familiarize Yourself with Test Questions

Become comfortable with the types of questions you'll find on the Praxis tests

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

Understanding Computer-Delivered Questions

Questions on computer-delivered tests are interactive in the sense that you answer by selecting an option or entering text on the screen. If you see a format you are not familiar with, read the directions carefully. The directions always give clear instructions on how you are expected to respond.

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

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

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

Remember that with every question you will get clear instructions.

Perhaps the best way to understand computer-delivered questions is to view the [Computer-delivered Testing Demonstration](#) on the Praxis web site to learn how a computer-delivered test works and see examples of some types of questions you may encounter.

Understanding Selected-Response Questions

Many selected-response questions begin with the phrase “which of the following.” Take a look at this example:

Which of the following is a flavor made from beans?

- (A) Strawberry
- (B) Cherry
- (C) Vanilla
- (D) Mint

How would you answer this question?

All of the answer choices are flavors. Your job is to decide which of the flavors is the one made from beans.

Try following these steps to select the correct answer.

- 1) **Limit your answer to the choices given.** You may know that chocolate and coffee are also flavors made from beans, but they are not listed. Rather than thinking of other possible answers, focus only on the choices given (“which of the following”).
- 2) **Eliminate incorrect answers.** You may know that strawberry and cherry flavors are made from fruit and that mint flavor is made from a plant. That leaves vanilla as the only possible answer.
- 3) **Verify your answer.** You can substitute “vanilla” for the phrase “which of the following” and turn the question into this statement: “Vanilla is a flavor made from beans.” This will help you be sure that your answer is correct. If you’re still uncertain, try substituting the other choices to see if they make sense. You may want to use this technique as you answer selected-response questions on the practice tests.

Try a more challenging example

The vanilla bean question is pretty straightforward, but you’ll find that more challenging questions have a similar structure. For example:

Entries in outlines are generally arranged according to which of the following relationships of ideas?

- (A) Literal and inferential
- (B) Concrete and abstract
- (C) Linear and recursive
- (D) Main and subordinate

You’ll notice that this example also contains the phrase “which of the following.” This phrase helps you determine that your answer will be a “relationship of ideas” from the choices provided. You are supposed to find the choice that describes how entries, or ideas, in outlines are related.

Sometimes it helps to put the question in your own words. Here, you could paraphrase the question in this way: “How are outlines usually organized?” Since the ideas in outlines usually appear as main ideas and subordinate ideas, the answer is (D).

QUICK TIP: Don't be intimidated by words you may not understand. It might be easy to be thrown by words like "recursive" or "inferential." Read carefully to understand the question and look for an answer that fits. An outline is something you are probably familiar with and expect to teach to your students. So slow down, and use what you know.

Watch out for selected-response questions containing "NOT," "LEAST," and "EXCEPT"

This type of question asks you to select the choice that does not fit. You must be very careful because it is easy to forget that you are selecting the negative. This question type is used in situations in which there are several good solutions or ways to approach something, but also a clearly wrong way.

How to approach questions about graphs, tables, or reading passages

When answering questions about graphs, tables, or reading passages, provide only the information that the questions ask for. In the case of a map or graph, you might want to read the questions first, and then look at the map or graph. In the case of a long reading passage, you might want to go ahead and read the passage first, noting places you think are important, and then answer the questions. Again, the important thing is to be sure you answer the questions as they refer to the material presented. So read the questions carefully.

How to approach unfamiliar formats

New question formats are developed from time to time to find new ways of assessing knowledge. Tests may include audio and video components, such as a movie clip or animation, instead of a map or reading passage. Other tests may allow you to zoom in on details in a graphic or picture.

Tests may also include interactive questions. These questions take advantage of technology to assess knowledge and skills in ways that standard selected-response questions cannot. If you see a format you are not familiar with, **read the directions carefully**. The directions always give clear instructions on how you are expected to respond.

QUICK TIP: Don't make the questions more difficult than they are. Don't read for hidden meanings or tricks. There are no trick questions on *Praxis* tests. They are intended to be serious, straightforward tests of your knowledge.

Understanding Constructed-Response Questions

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

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

Take a look at a few sample essay topics:

- "Celebrities have a tremendous influence on the young, and for that reason, they have a responsibility to act as role models."
- "We are constantly bombarded by advertisements—on television and radio, in newspapers and magazines, on highway signs, and the sides of buses. They have become too pervasive. It's time to put limits on advertising."
- "Advances in computer technology have made the classroom unnecessary, since students and teachers are able to communicate with one another from computer terminals at home or at work."

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

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

QUICK TIP: You may find that it helps to take notes on scratch paper so that you don't miss any details. Then you'll be sure to have all the information you need to answer the question.

For tests that have constructed-response questions, more detailed information can be found on page 5.

3. Practice with Sample Test Questions

Answer practice questions and find explanations for correct answers

Pedagogy Sample Test Questions

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

1. The primary purpose of scaffolding student learning is to
 - (A) reinforce the desired student performance
 - (B) assist the students in a task until independent progress is possible
 - (C) encourage the development of self-regulatory skills
 - (D) enable the students to visualize ideas

2. To determine how well students in an eighth-grade class are reading compared with other students in the nation, the teacher should examine the results of which of the following types of tests?
 - (A) A criterion-referenced reading test
 - (B) A norm-referenced reading test
 - (C) An aptitude test
 - (D) An informal reading inventory

3. According to Bloom's Taxonomy of educational objectives, which of the following levels of cognition is best defined as the ability to break information into parts to see how the parts relate to the whole?
 - (A) Understanding
 - (B) Applying
 - (C) Analyzing
 - (D) Remembering

4. Which of the following is most likely to be effective as a summative assessment?
 - (A) A teacher's anecdotal records about a student's reading behaviors
 - (B) A student's daily journal writing
 - (C) A teacher's observation of a student during independent mathematics work
 - (D) A student's collection of original poems at the end of a poetry unit

5. To help the English-language learners in her seventh-grade class develop their speaking and listening skills, Ms. Short plans an activity in which each student will interview a partner and introduce him or her to the rest of the class. Which of the following should Ms. Short do to best help the ELLs perform well in the activity?
 - (A) Present a model of an interview and an introduction in which a student from the previous year interviews Ms. Short and then introduces her.
 - (B) Provide a set of written guidelines on conducting an interview and introducing another person.
 - (C) Have students discuss among themselves what completing the activity successfully will require.
 - (D) Provide the rubric by which both the interviews and the introductions will be evaluated.

6. The administrators of a school are finalizing a decision to suspend a teacher. They have given the teacher written notice, including the dates of and reason for the suspension. They have also scheduled a meeting to allow the teacher to argue against the suspension. The administrators' actions are consistent with which of the following?
- (A) Liability
 - (B) Due process
 - (C) Equal access
 - (D) Confidentiality
7. Research findings about classroom management suggest that one of the most effective ways to maximize the amount of time students spend on academic activities is for the teacher to do which of the following?
- (A) Plan for, teach, and enforce routines for transition times and classroom housekeeping tasks
 - (B) Assign homework three times a week in core content areas
 - (C) Assign individual reading on new topics before discussing the topic in class
 - (D) Introduce new material in a lecture followed immediately by a question-and-answer session on the material
8. During a visit to a fourth-grade classroom, a student teacher observes a student spending time allotted for a worksheet either looking out the window or doodling on his paper. When the student teacher asks the student if he needs help on the assignment, he says no. When asked why he isn't doing the work, he points to another student and says, "She does all her work fast and when she's finished, she gets more work." The boy's reaction suggests which of the following about his classroom?
- (A) A routine has been established for students who are having trouble finishing the assignment to ask the teacher for assistance.
 - (B) A routine is not in place for rewarding students who finish work promptly.
 - (C) Students must work alone on seatwork, without consulting other students.
 - (D) Students who finish work before the whole class is finished must not interrupt the students who are still working.
9. Dan is a student in Ms. Kane's fifth-grade class under the least restrictive environment provision of the Individuals with Disabilities Education Act (IDEA). One of Dan's IEP objectives addresses his limited attention span and states, "Given a 10- to 12-minute lecture/oral lesson, Dan will take appropriate notes as judged by the teacher." Which of the following strategies will best help Dan meet the objective?
- (A) Ms. Kane grades Dan's notes on the lecture/oral lesson material and incorporates the grade into Dan's overall class grade.
 - (B) Ms. Kane allows Dan to tape-record the lecture/oral lesson, rather than take notes, and then to play the tape at home to learn the material.
 - (C) Ms. Kane provides Dan with a graphic organizer, or skeleton outline, of the lecture so Dan can fill in the missing information as provided.
 - (D) Ms. Kane seats Dan with a student he says he likes and allows Dan to ask that student questions as the lecture/oral lesson proceeds.

10. Which of the following kinds of instruction is frequently contrasted with discovery learning?
- (A) Simulation game
 - (B) Expository teaching
 - (C) Mastery learning
 - (D) Schema training
11. Which of the following is a type of test score used to show a student's relative position among a group of students in the same grade who are tested at the same time?
- (A) Percent correct
 - (B) Percentile rank
 - (C) Raw score
 - (D) Composite score
12. Which of the following correctly states an aspect of effective reflective practice?
- (A) Peer coaching should be done sparingly because it can interfere with a coach's own reflective potential.
 - (B) To remain truly professional, reflective practice should exclude student input that challenges teaching practices.
 - (C) The reflection process should be free of links to conceptual frameworks that limit inquiry and problem solving.
 - (D) Teacher coaches should create an environment of trust and build a context for reflection that is unique to every learning situation.

Questions 13-14 refer to the following passage.

A science teacher is teaching a unit that includes a group of activities based on making small mechanical devices. Students are individually assigned to create a device using parts provided in class. When the students have finished making the devices to the teacher's satisfaction, the teacher writes the following assignment on the board and verbally goes over the instructions to ensure that the students understand them.

In-class written activity:

- Draft directions describing how to assemble the device you created in class.
- After drafting your directions, rewrite them so that they are neat and easy to read.
- Be sure the directions you write would be clear to another student who has no previous experience with your device.
- Your directions can be in any format—for example, short sequential statements, a list of steps, descriptive paragraphs, etc.

13. When students finish the activity, the teacher says, "Trade the draft directions with your lab partner. You and your lab partner should try out each other's directions by using the box of parts in front of you. You should see if the directions are clear, and you should give each other tips on how to improve the directions." At this point in the lesson, the teacher is using which of the following types of assessments?
- (A) Summative and informal
 - (B) Peer and informal
 - (C) Portfolio and formal
 - (D) Formative and formal

14. The teacher instructs the students to use the feedback from their lab partners to improve and finalize their directions and then, to put the directions in a formatted, word-processed document, and hand in the document at the next class. When the students hand in the assignments, the teacher sees that one of the students has used a series of diagrams and pictures as the basis for her directions. Which of the following states the most appropriate assessment for the teacher to make?
- (A) The student showed creativity in interpreting the directions.
 - (B) The student carried out the instructions exactly as specified.
 - (C) The student did not follow the directions and will receive a low grade for the assignment.
 - (D) The student must redo the assignment and follow the directions more closely.
15. Students in a sixth-grade class are trying to find a way to deal with the problem of wasted food in the school lunchroom. They have invited the district director of food services to speak with the class. The students are at which of the following steps in the problem-solving process?
- (A) Develop criteria to evaluate possible solutions to the problem
 - (B) Brainstorm possible solutions to the problem
 - (C) Gather facts and information about the problem
 - (D) Develop a plan to implement the best solution to the problem
16. Which of the following is best for a teacher to do when establishing classroom rules?
- (A) Mention the rules once at the beginning of the school year
 - (B) State the rules in a forceful way to establish authority
 - (C) Explain why the established rules are necessary for enhancing student cooperation
 - (D) Create as many rules as possible to guarantee order and control in the classroom
17. Mr. Young's middle school students are having difficulty with a project that asks them to keep a notebook in which they record careful, systematic scientific observations and then write two possible hypotheses that could be tested on the basis of the observations. Which of the following theories might best help him understand why so many of his students are having difficulty with the project?
- (A) Erik Erikson's theory on the stages of psychological development
 - (B) Jerome Bruner's theory on how information is processed
 - (C) Jean Piaget's theory on the stages of cognitive development
 - (D) Lev Vygotsky's theory on social learning
18. Which of the following professional strategies is most likely to result in improved student motivation and academic performance?
- (A) Each teacher employs the classroom management techniques with which he or she feels most comfortable
 - (B) Teachers collaborate to formulate, select, and monitor classroom management techniques and other classroom procedures based on successful experiences
 - (C) A subset of teachers determines the rules to be given to the other teachers who then impose the rules on their classes
 - (D) Teachers elect a colleague to represent them in working with the administration to determine a set of five best practices to be used at each teacher's discretion

Answers to Pedagogy Sample Questions

1. The best answer is (B). The ultimate goal of scaffolding is for students to gain a firm enough grasp of the content or skill so they can perform tasks independently. For this to happen, the teacher introduces a new concept to students and gives them all the assistance that they require in the beginning, gradually lessening assistance until students are able to handle things on their own.

2. The best answer is (B). A norm-referenced reading test compares the performance of each student with the performance of a local or national norm group.

3. The best answer is (C). In Bloom's Taxonomy of educational objectives, analyzing is defined as the ability to break down information into parts to see how the parts relate to the whole.

4. The best answer is (D). A collection of original poetry is summative. It is designed to evaluate students' understanding at the end of the unit—in this case, the completion of the unit on poetry.

5. The best answer is (A). When working with English-language learners, teachers must keep in mind that reading, writing, listening, and speaking are all parts of language learning. Modeling the interview allows the students to observe a variety of speaking and listening skills and to note cultural differences—for example, tone of voice and eye contact.

6. The best answer is (B). The scenario describes aspects of a situation that require due process. Any time an individual is deprived of the right to something they have previously enjoyed, he or she must be provided with notice of what kind of action will be taken, when it will take place, and why the action will be taken. The individual must also have the opportunity to explain why the action should not be taken.

7. The best answer is (A). Too much time is often spent supervising students in relation to personal needs and everyday housekeeping tasks. Interruptions for this purpose are a major source of discontinuity in academic activities. Teachers can minimize these problems by organizing the classroom and preparing students to handle routine activities on their own.

8. The best answer is (B). Students are quick to learn routines for work incentives and penalties, as the student's remark implies. No routine has been established to reward students who finish their work early.

9. The best answer is (C). This question asks you to identify an instructional strategy that provides the student with a clearly structured activity to keep him on task to reach the Individualized Education Program (IEP) objectives. The information provided about Dan tells you that the strategy the teacher chooses must help Dan in two ways: it must keep his attention from wandering, and it must help him to follow what is going on in the lesson. In addition, the strategy needs to provide the teacher with assessment information to use in evaluating Dan's progress.

10. The best answer is (B). Discovery learning allows students to explore material on their own and arrive at conclusions. In expository teaching, students are presented with subject matter organized by the teacher.

11. The best answer is (B). A student's percentile rank indicates the percent of students in a particular group that received lower raw scores on a test than the student did. It shows the student's relative position, or rank, among a group of students in the same grade who were tested at the same time of year (fall, midyear, or spring). For example, if a student earned a percentile rank of 72 on a test, the student scored higher than 72 percent of the students in the group, and, conversely, 28 percent of the students in the group scored higher than the student. Percentile ranks from 1 to 99.

12. The best answer is (D). Trust is essential to teaching contexts that enhance reflective practice. Student input (B) would be useful for improving teaching practices, but would not promote reflection. Conceptual frameworks (C) do not limit inquiry. Rather, they focus and provide discipline for the reflective process. The collaboration between peers in a coaching situation (A) often promotes reflection.

13. The best answer is (B). Since the students are instructed to assess each other's drafts and the teacher does not record the results, peer assessment and informal assessment are the types of assessment the teacher is using.

14. The best answer is (A). Given the teacher's initial directions, the student's way of completing the assignment was creative although not in keeping with the letter of the assignment, which referenced writing three times. While the teacher may have had something else in mind, such as an assessment of the students' writing abilities, the directions were open-ended enough that having the student redo the assignment or giving it a low grade would be excessively rigid and not fair or appropriate.

15. The best answer is (C). The invitation to the director of food services is an opportunity for the students to gather facts and information about the problem. There is no indication given that the students have begun to brainstorm solutions, evaluate the possible solutions, or develop an implementation plan.

16. The best answer is (C). Students are more cooperative with rules that make sense to them than they are with seemingly arbitrary regulations.

17. The best answer is (C). Jean Piaget's work supported a "stage theory" of cognitive development in which children progress from completely physical and tactile methods of understanding the environment and experience (the sensorimotor stage) to methods of understanding that allow them to understand abstract explanations and generalizations across many different kinds of experiences (the formal operational stage). Piaget's classification of stages of developmental readiness suggests that these students may not yet have reached the readiness level to move from concrete observations (concrete operational) to abstract hypotheses (formal operational).

18. The best answer is (B). An organized, focused, collaborative effort to share ideas, determine actions, and monitor results is most likely to meet with success.

English Language Arts Sample Test Questions

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

1. The following is an Iroquois poem entitled “Darkness Song.”

We wait in the darkness!
Come, all ye who listen,
Help in our night journey:

Line Now no sun is shining;
(5) Now no star is glowing;
Come show us the pathway:
The night is not friendly;
She closes her eyelids;
The moon has forgot us,
We wait in the darkness!

In the context of the poem, the phrase “She closes her eyelids” (line 8) most likely refers to the

- (A) refusal of the speaker’s companion to keep walking
(B) twinkling of the stars in the night sky
(C) darkness of the night sky
(D) setting of the sun behind the forest
2. _____ is a narrative that takes abstract ideas of behavior—good or bad, wise or foolish—and attempts to make them concrete and striking. The chief actor in these stories is usually an animal or inanimate object that behaves like a human and engages in a single significant act intended to teach a moral lesson.

Which of the following will correctly complete the passage above?

- (A) A myth
(B) A fable
(C) An epic
(D) A legend

3. Though Josh mentioned that she was a good friend, Anna knew it was a hollow compliment.

In the sentence above, the word “hollow” is best defined as

- (A) deep
(B) sunken
(C) vicious
(D) insincere
4. The following passage is from “Sonny’s Blues” by James Baldwin.

These boys . . . were growing up with a rush and their heads bumped abruptly against the low ceiling of their actual possibilities. They were filled with rage. All they really knew were two darknesses, the darkness of their lives, which was now closing in on them, and the darkness of the movies, which had blinded them to that other darkness, and in which they now, vindictively, dreamed, at once more together than they were at any other time, and more alone.

The author uses images of a “low ceiling” and “darkness” in order to portray life experiences that are

- (A) limitless
(B) empty
(C) restricted
(D) fulfilling
5. Science fiction: readers claim to either love it or loathe it; either they avoid it like poison or they devour favorite works and authors like chocolate addicts gulping down fudge truffles.

The author of the passage compares certain readers with “chocolate addicts” primarily in order to

- (A) suggest that science fiction is not a serious literary genre
(B) indicate the depth of certain readers’ feelings about science fiction
(C) explain why some readers consider science fiction to be dangerous
(D) contrast the characteristics of science fiction with those of other literary genres

6. Freewriting, brainstorming, clustering, and idea mapping are most important during which stage of the writing process?

(A) Prewriting
 (B) Drafting
 (C) Revising
 (D) Proofreading

7.

- I. The teacher from Nebraska displayed Native American artifacts to her class.
 II. The teacher displayed Native American artifacts from Nebraska to her class.

The meaning of sentence I differs from that of sentence II in that the

- (A) subject of sentence I is “teacher” whereas the subject of sentence II is “artifacts”
 (B) first sentence ends in a prepositional phrase whereas the second sentence does not
 (C) sentences do not have the same simple predicate
 (D) adjective phrase “from Nebraska” modifies different nouns

Questions 8-9 refer to the following student draft.

A seventh-grade class is learning how to respond to literary analysis prompts. The following is a student response to the prompt “Describe the significance of the White Rabbit in *Alice’s Adventures in Wonderland*, by Lewis Carroll.”

(1) The White Rabbit represents an adult who worries about schedules; he says, “Oh my ears and whiskers, how late it’s getting!” (2) Alice wanders after the rabbit down the hole because, unknown to her, she wishes to not be a child anymore, she wants to be an adult. (3) When she follows the rabbit down the hole, she makes the choice to transform into an adult and leave her childish ways behind. (4) She begins her journey to Wonderland confused about all of her choices. (5) The author uses The White Rabbit as a metaphor to contrast with the childish ways Alice is leaving behind. (6) Her choices are like the choices she will have to make as she gets older.

8. Which of the following revisions will best improve the clarity of the response?
 (A) Switch sentence 1 and sentence 5
 (B) Switch sentence 2 and sentence 3
 (C) Switch sentence 4 and sentence 6
 (D) Switch sentence 5 and sentence 6
9. Which of the following errors is present in sentence 2?
 (A) Comma splice
 (B) Faulty parallelism
 (C) Incorrect subject-verb agreement
 (D) Inconsistent verb tense

Answers to English Language Arts Sample Questions

1. The correct answer is (C). The statement “She closes her eyelids” refers back to the night mentioned in line 7. Since there is no light from the Sun or the stars (lines 4–5), the sky is dark and the night can be said to have closed its eyelids, or blocked out the light. (A) is incorrect because line 8 refers to the night, not the speaker’s companion. (B) is incorrect because line 5 explains that there are no stars in the night sky. (D) is incorrect because the speaker describes being surrounded by darkness, which indicates that the Sun has already set.

2. The correct answer is (B). The statements on which the question is based constitute a definition of a fable. While all of the choices are types of narratives, only a fable fits the full description.

3. The correct answer is (D). The use of the word “though” in the clause “Though Josh mentioned that she was a good friend” indicates that the compliment was not sincere. (A) is incorrect because describing a compliment as “deep” could indicate that the compliment was heartfelt and therefore would not logically follow the first clause. (B) is incorrect because “sunken” describes a physical state, which is not relevant to the sentence. (C) is incorrect because “vicious” is not a synonym for “hollow.”

4. The correct answer is (C). The boys bump against the “low ceiling of their actual possibilities,” suggesting that the actual possibilities in the boys’ lives have been restricted. Similarly, “the darkness of their lives” is “closing in on them,” or beginning to restrict the boys’ experiences and possibilities. (A) and (D) are incorrect because the imagery suggests that the boys’ life experiences have been negative rather than positive. (B) is incorrect because the author explains that the boys know only “two darknesses,” suggesting that their lives are restricted in scope but are not empty.

5. The correct answer is (B). The author makes a comparison between science fiction readers and people who love chocolate so much they could be called addicts in order to stress that those who like science fiction cannot get enough of it. The comparison between science fiction readers and chocolate addicts does not suggest that science fiction is not a serious genre (A) or that it is considered dangerous (C), and it does not establish a contrast between science fiction and other genres (D).

6. The correct answer is (A). The terms mentioned are processes and devices associated with generating new ideas and organizing them. These processes and devices would not be associated with proofreading (D). While they might be part of drafting (B) or revising (C), they are most important during the prewriting stage of the writing process.

7. The correct answer is (D). The meaning of the two sentences differs because in sentence I the teacher is “from Nebraska” and in sentence II the Native American artifacts are “from Nebraska.” Thus, the placement of the adjective phrase “from Nebraska” after two different nouns changes the meaning of the sentences. (A) is incorrect because “teacher” is the subject of both sentences. (B) is incorrect because both sentences end in the prepositional phrase “to her class.” (C) is incorrect because the simple predicate of both sentences is “displayed.”

8. The correct answer is (D). Sentence 6 is most appropriate after sentence 4 because it clarifies why Alice is confused about the choices she must make in Wonderland. Sentence 5 is an appropriate conclusion because it ties back to the thesis stated in sentence 1. (A) is incorrect because sentence 1 is most appropriate as the opening of the paragraph; it introduces the main idea of the response. Also, the quotation contained within sentence 1 would not make sense if placed in sentence 5’s current position. (B) is incorrect because these sentences contain similar information. Switching their placement would not contribute to overall clarity. (C) is incorrect because the fact that Alice is making choices in Wonderland must be introduced, as it is in sentence 4, before the nature of her choices can be discussed in more detail, as it is in sentence 6.

9. The correct answer is (A). The comma between “anymore” and “she wants” is a comma splice; it is used incorrectly to separate two independent clauses. (B) and (C) are incorrect because there are no examples of faulty parallelism or incorrect subject-verb agreement in sentence 2. (D) is incorrect because all of the verbs used in sentence 2 are in the present tense.

Social Studies

Sample Test Questions

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

10. The majority of immigrants who arrived in the United States before the Civil War came from
- (A) northern and western Europe
 - (B) southern and eastern Europe
 - (C) Latin America and the Caribbean
 - (D) Asia and the Pacific Islands
11. Which of the following resulted from President Franklin D. Roosevelt's New Deal?
- (A) All large banks were nationalized
 - (B) The United States Supreme Court gained two new justices
 - (C) The national government grew in size, scope, and responsibility
 - (D) Decisions about welfare spending were entrusted to the states
12. Which of the following major world religions is monotheistic?
- (A) Hinduism
 - (B) Buddhism
 - (C) Islam
 - (D) Shintoism
13. The buildup of military forces and the formation of a rigid military alliance system were major causes of which of the following wars?
- (A) The Spanish-American War
 - (B) The First World War
 - (C) The Second World War
 - (D) The Vietnam War
14. According to the United States Constitution, the president is given the power to do which of the following?
- (A) Impeach judges
 - (B) Pass laws
 - (C) Coin money
 - (D) Veto bills
15. Which of the following is an effect of inflation?
- (A) Consumer buying power decreases
 - (B) Consumer buying power increases
 - (C) Interest rates generally decline
 - (D) Exports increase
16. Which of the following types of maps shows the boundaries of countries, states, or municipalities?
- (A) Thematic
 - (B) Topographic
 - (C) Political
 - (D) Meteorological

Answers to Social Studies Sample Questions

10. The correct answer is (A). Prior to the Civil War, immigration to the United States came almost exclusively from northern and western Europe, with large numbers of people coming from Ireland, Great Britain, Germany, and Scandinavia. The immigration wave from southern and eastern Europe followed the Civil War, peaking in the late nineteenth and early twentieth centuries. Immigration from Latin America and the Caribbean did not become significant numerically until the second half of the twentieth century. Immigration from Asia and the Pacific Islands was significant in the last quarter of the nineteenth century and in the second half of the twentieth century.

11. The correct answer is (C). Roosevelt's New Deal established a wide range of new federal agencies concerned with issues including financial regulation of the economy, social welfare, and economic development, thereby expanding the size, scope, and responsibility of the national government. Banks were not nationalized, the size of the Supreme Court did not expand, and decisions about welfare spending were concentrated in the federal government.

12. The correct answer is (C). Of the major world religions listed, Islam is the only one that is monotheistic. Each of the other religions listed has, as a central tenet, a belief in more than one deity.

13. The correct answer is (B). The buildup of military forces by European powers and the formation of a rigid military alliance system pitting the Allies (primarily Great Britain, France, and Russia) against the Central Powers (primarily Germany, Austria-Hungary, and Serbia) is a common explanation for the origins of the First World War. These circumstances did not apply to the Spanish-American War, the Second World War, or the Vietnam War.

14. The correct answer is (D). Article II of the United States Constitution spells out the powers of the president. Among them is the power to reject, or veto, a law that is passed by Congress. Only the House of Representatives has the power to impeach a federal official or a judge. Passing laws and coining money are both powers of the United States Congress.

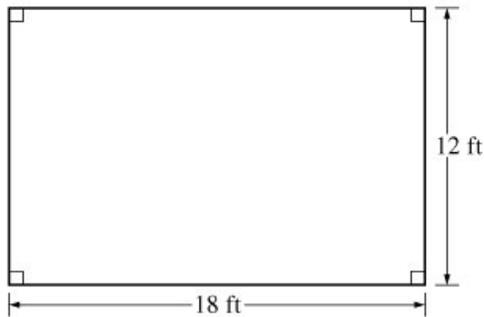
15. The correct answer is (A). Inflation is an economic condition characterized by a general rise in prices in an economy. In periods of high inflation, the same amount of money buys fewer goods; therefore, consumer buying power decreases.

16. The correct answer is (C). A political map shows boundaries of countries, states, and municipalities. A thematic map presents specific information related to a geographic area, such as the location of natural resources. A topographic map shows the physical features of the land. A meteorological map presents information about weather and climate.

Mathematics Sample Test Questions

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

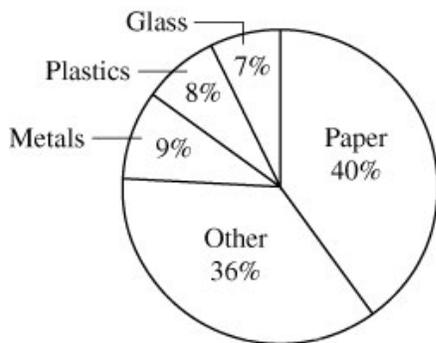
ANN'S LIVING ROOM



- Ann plans to place a continuous wallpaper border on the walls of her living room, shown above. Each roll costs \$6.47, and no partial rolls are sold. If each roll of border is 8 feet long, what is the minimum amount Ann can spend on rolls of border to complete her project?
 - \$45.29
 - \$51.76
 - \$103.50
 - \$174.69
- The original price of a certain car was 25 percent greater than its cost to the dealer. The actual selling price was 25 percent less than the original price. If c is the cost of the car to the dealer and p is the selling price, which of the following represents p in terms of c ?
 - $p = 1.00c$
 - $p = 1.25c$
 - $p = 0.25(0.75c)$
 - $p = 0.75(1.25c)$

Number of Hours Watched per Day	Number of People
$h < 1$	5
$1 \leq h < 2$	12
$2 \leq h < 3$	16
$3 \leq h < 4$	14
$h \geq 4$	3

- In a survey, 50 people were asked how many hours per day (h) they watched television. The survey results are shown in the table above. If a person is selected at random from those surveyed, what is the probability that the person selected will have watched at least 2 hours but less than 4 hours per day?
 - $\frac{3}{10}$
 - $\frac{8}{25}$
 - $\frac{1}{2}$
 - $\frac{3}{5}$
- A rectangular lawn is 40 feet wide and 65 feet long. If a bag of fertilizer covers 10,400 square feet, how many times can the lawn be completely fertilized using a single bag of fertilizer?
 - 3
 - 4
 - 5
 - 7
- In a class of 29 students, 20 students have dogs and 15 students have cats. How many of the students have both a dog and a cat?
 - None of the children necessarily have both.
 - Exactly 5 students have both.
 - Exactly 6 students have both.
 - At least 6 students and at most 15 students have both.



6. The graph above shows the distribution of the contents, by weight, of a county's trash. If approximately 60 tons of the trash consists of paper, approximately how many tons of the trash consist of plastics?

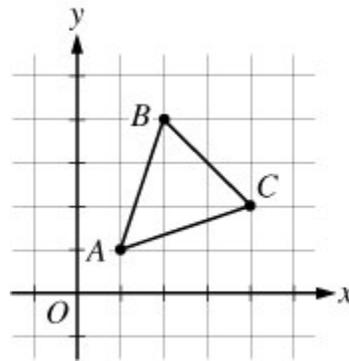
(A) 24
 (B) 20
 (C) 15
 (D) 12

7. A school district bought \$42,500 worth of computer equipment and agreed to pay \$12,500 upon delivery and the remaining amount in equal monthly payments of \$1,500 each. Which of the following calculations can be used to determine the total number of monthly payments required?

(A) $\frac{42,500 - 1,500}{12,500}$
 (B) $\frac{42,500 - 12,500}{1,500}$
 (C) $\frac{42,500}{1,500} - 12,500$
 (D) $\frac{42,500}{12,500} - 1,500$

8. An art teacher brings 36 pieces of fruit to a drawing class so that each student will have exactly one piece of fruit to draw. The teacher brings apples, pears, and bananas in the ratio of 3 to 2 to 1, respectively. How many pears does the teacher bring?

(A) 6
 (B) 8
 (C) 10
 (D) 12



9. In the xy -plane, the triangle ABC is to be reflected about the y -axis to form triangle $A'B'C'$. What will be the coordinates of C' ?

(A) $(-4, -2)$
 (B) $(-4, 2)$
 (C) $(-2, -4)$
 (D) $(-2, 4)$

Answers to Mathematics Sample Questions

1. (B) is correct. The minimum length of wallpaper border needed to decorate the room is equal to the perimeter of Ann's living room. The perimeter is the sum of the lengths of the four walls of the room, or $18 + 18 + 12 + 12 = 60$ feet. The number of rolls of border needed is determined by dividing the perimeter by the length of each roll of border, and $\frac{60 \text{ feet}}{8 \text{ feet}} = 7.5$.

Therefore, Ann needs a minimum of 7.5 rolls, and since no partial rolls are sold, she must buy 8 rolls. The cost of 8 rolls of the border is found by multiplying the cost of each roll, \$6.47, by the number of rolls needed, so the final answer is $\$6.47 \times 8 = \51.76 .

2. (D) is correct. This question asks you to apply your knowledge of percent increase or decrease to determine a selling price based on cost of a car to the dealer, c . Since the original price of the car was 25 percent greater than the cost to the dealer, the original price was $c + 0.25c = 1.25c$. Since the selling price was 25 percent less than that amount, only 75 percent of that amount was paid, and therefore the selling price of the car, p , is equal to $0.75(1.25c)$.

3. (D) is correct. Based on the data in the table, a total of $16 + 14 = 30$ people surveyed watched at least 2 hours of television but less than 4 hours of television per day. If a person is selected at random from those surveyed, the probability that the person selected will have watched at least 2 hours but less than 4 hours per day is $\frac{30}{50} = \frac{3}{5}$.

4. (B) is correct. The area of the lawn is $(40)(65) = 2,600$ square feet. The number of times the lawn can be completely fertilized using a single bag of fertilizer is

$$\frac{10,400}{2,600} = 4 \text{ times.}$$

5. (D) is correct. Since the 29 students have a total of 35 dogs and cats, at least 6 must have both a dog and a cat. If there are exactly 6 students with both a dog and a cat, then 14 students have only a dog and 9 students have only a cat. On the other hand, all 15 cat owners could also have a dog; then 5 students have only a dog and 9 students have neither a dog nor a cat. Thus, the correct answer is (D).

6. (D) is correct. One of the ways to solve the problem is to use the information about the trash that consists of paper to find the total weight of the county's trash, and then use this information to find how many tons of the trash consist of plastics. The problem states that 60 tons of the trash consists of paper, and the graph shows that this amount equals 40% of the total, so $60 = 0.4 \times (\text{total weight of trash})$, and the total weight of trash is $\frac{60}{0.4} = 150$ tons. Then, the weight of trash that

consists of plastics equals 8% of 150 tons, or $(0.08)(150)$, which equals 12 tons. Alternatively, the problem can be solved using the fact that the ratio of plastics to paper in the trash is the same, whether the two amounts are given as percents or in tons. This gives

$$\text{the proportion } \frac{\text{tons of plastics}}{\text{tons of paper}} = \frac{8\%}{40\%} \text{ or}$$

$\frac{\text{tons of plastics}}{60} = \frac{8}{40}$, and when the proportion is solved the same answer of 12 tons is obtained.

7. (B) is correct. The school district bought \$42,500 worth of computer equipment and agreed to pay \$12,500 upon delivery, so the remaining amount to be paid is $42,500 - 12,500$. Since the school district agreed to pay \$1,500 per month, the total number of monthly payments required is $\frac{42,500 - 12,500}{1,500}$.

8. (D) is correct. Let x be the number of bananas that the teacher brings to the drawing class. Then $3x$ and $2x$ will be the number of apples and pears, respectively. Since $3x + 2x + x = 36$, $x = 6$, and so the number of pears the teacher brings is $2x = 2(6) = 12$.

9. (B) is correct. The coordinates of point C are $(4, 2)$. When a point is reflected over the y -axis, the x -coordinate of the point changes to its opposite, but the y -coordinate remains the same, so $(4, 2)$ is transformed to $(-4, 2)$, which means the coordinates of C' are $(-4, 2)$.

Science Sample Test Questions

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

10. A scientific experiment was conducted to determine the effect of a newly developed synthetic growth hormone, PGH, on pea seedlings. One group of seedlings was treated with PGH while another group of the same variety was left untreated. All environmental conditions were kept the same for both groups of seedlings. Data collected over 10 days are provided in the table below.

Time (days)	Average Height (cm)	
	Treated Group	Untreated Group
1	3.0	2.5
3	3.6	3.0
4	4.7	3.9
5	5.6	4.6
7	6.2	5.0
9	6.9	5.4
10	7.4	5.8

Based on the results of this experiment, which of the following is the best conclusion about the effect of PGH?

- (A) PGH can be used to stimulate growth in many different agricultural crops.
- (B) PGH is as effective as natural growth factors in pea plants.
- (C) PGH can be used to increase the yield of peas per acre for this variety of peas.
- (D) PGH stimulates growth in seedlings of this variety of peas.
11. During the nineteenth century, some bird species, such as starlings, were introduced into the United States from Europe. Since then they have spread throughout the country and become a nuisance, or pest species, especially in urban areas. They often drive native birds out of their habitats. Factors that have contributed to the starling's success in the United States most likely include all of the following EXCEPT
- (A) appropriate locations for nesting
- (B) a suitable range of temperatures
- (C) an abundance of natural predators
- (D) an availability of a variety of food sources
12. Some human traits are carried by genes on the Y chromosome. A man will transmit these traits to
- (A) one-half of his male offspring only
- (B) one-half of his female offspring only
- (C) all of his male offspring
- (D) all of his female offspring
13. "Shooting stars" that appear in the night sky are most likely to be
- (A) particles of exploding stars
- (B) comets passing near Earth
- (C) meteors passing into Earth's atmosphere
- (D) northern or southern lights caused by magnetic storms on the Sun
14. A chlorine compound is added to swimming pools in order to
- (A) monitor the pH of the water
- (B) add color to the water
- (C) soften the water by precipitating harmful chemicals
- (D) destroy bacteria through an oxidation reaction

15. Which of the following methods of producing electricity contributes most of the incidence of acid rain in North America?
- (A) Generators that use windmills
 - (B) Nuclear generators that utilize fission
 - (C) Power plants that burn fossil fuels
 - (D) Hydroelectric power plants
16. Two campers want to bake potatoes in a fire. Both wrap their potatoes in aluminum foil. One camper, however, sticks a large nail through her potato.

Which of the following is most likely to happen after the potatoes are placed in the fire?

- (A) Both potatoes will cook at the same rate.
- (B) Neither potato will cook because the foil will reflect the heat.
- (C) The potato with the nail will cook faster because heat will be conducted into the potato.
- (D) The potato with the nail will cook more slowly because heat will be conducted out of the potato.

Answers to Science Sample Questions

10. The correct answer is (D). The data show that for the particular variety of peas used in the experiment, seedlings treated with PGH were taller than the control group seedlings each day that a measurement was taken. The results do not suggest a mechanism by which PGH is stimulating growth. In addition, no other factors or types of plants were tested. The only statement that accurately describes the results, therefore, is (D).

11. The correct answer is (C). The European starling was introduced into the United States in 1890. Environmental conditions in the United States were appropriate for the reproduction and survival of this species. However, as happens with many species, there are few, if any, natural predators or competitors in their new habitats. This allowed starlings to thrive in their new ecosystems and reduce populations of native species. An abundance of predators would have kept the number of starlings from increasing greatly and, therefore, (C) would not be a factor that contributed to their success.

12. The correct answer is (C). Human males generally have one X and one Y chromosome. Male offspring will only receive a Y chromosome from their father, while female offspring will only receive an X chromosome from their father. Therefore, genes on the Y chromosome are passed only to male offspring.

13. The correct answer is (C). "Shooting stars" are meteors that have entered into Earth's atmosphere where frictional heating has caused them to glow.

14. The correct answer is (D). Chlorine and certain chlorine-containing compounds are highly reactive oxidizing agents that are used as chemical disinfectants in a variety of situations, including swimming pools.

15. The correct answer is (C). Acid rain is caused by the reaction of sulfur oxides and nitrogen oxides with water in the atmosphere to form acids. The burning of fossil fuels is a major source of these oxides.

16. Although the aluminum foil will reflect radiant energy, it will not significantly reduce the flow of energy by conduction. Because a nail is a good thermal conductor, heat will flow through the nail and cook the potato from the inside as well as from the outside. Thus, the potato with the imbedded nail will cook faster. (C) is the correct answer.

4. Determine Your Strategy for Success

Set clear goals and deadlines so your test preparation is focused and efficient

Effective *Praxis* test preparation doesn't just happen. You'll want to set clear goals and deadlines for yourself along the way. Otherwise, you may not feel ready and confident on test day.

1) Learn what the test covers.

You may have heard that there are several different versions of the same test. It's true. You may take one version of the test and your friend may take a different version a few months later. Each test has different questions covering the same subject area, but both versions of the test measure the same skills and content knowledge.

You'll find specific information on the test you're taking on page 5, which outlines the content categories that the test measures and what percentage of the test covers each topic. Visit www.ets.org/praxis/testprep for information on other *Praxis* tests.

2) Assess how well you know the content.

Research shows that test takers tend to overestimate their preparedness—this is why some test takers assume they did well and then find out they did not pass.

The *Praxis* tests are demanding enough to require serious review of likely content, and the longer you've been away from the content, the more preparation you will most likely need. If it has been longer than a few months since you've studied your content area, make a concerted effort to prepare.

3) Collect study materials.

Gathering and organizing your materials for review are critical steps in preparing for the *Praxis* tests. Consider the following reference sources as you plan your study:

- Did you take a course in which the content area was covered? If yes, do you still have your books or your notes?
- Does your local library have a high school-level textbook in this area? Does your college library have a good introductory college-level textbook in this area?

Practice materials are available for purchase for many *Praxis* tests at www.ets.org/praxis/testprep. Test preparation materials include sample questions and answers with explanations.

4) Plan and organize your time.

You can begin to plan and organize your time while you are still collecting materials. Allow yourself plenty of review time to avoid cramming new material at the end. Here are a few tips:

- Choose a test date far enough in the future to leave you plenty of preparation time. Test dates can be found at www.ets.org/praxis/register/centers_dates.
- Work backward from that date to figure out how much time you will need for review.
- Set a realistic schedule—and stick to it.

5) Practice explaining the key concepts.

Praxis tests with constructed-response questions assess your ability to explain material effectively. As a teacher, you'll need to be able to explain concepts and processes to students in a clear, understandable way. What are the major concepts you will be required to teach? Can you explain them in your own words accurately, completely, and clearly? Practice explaining these concepts to test your ability to effectively explain what you know.

6) Understand how questions will be scored.

Scoring information can be found on page 82.

7) Develop a study plan.

A study plan provides a road map to prepare for the *Praxis* tests. It can help you understand what skills and knowledge are covered on the test and where to focus your attention. Use the study plan template on page 54 to organize your efforts.

And most important—get started!

Would a Study Group Work for You?

Using this guide as part of a study group

People who have a lot of studying to do sometimes find it helpful to form a study group with others who are working toward the same goal. Study groups give members opportunities to ask questions and get detailed answers. In a group, some members usually have a better understanding of certain topics, while others in the group may be better at other topics. As members take turns explaining concepts to one another, everyone builds self-confidence.

If the group encounters a question that none of the members can answer well, the group can go to a teacher or other expert and get answers efficiently. Because study groups schedule regular meetings, members study in a more disciplined fashion. They also gain emotional support. The group should be large enough so that multiple people can contribute different kinds of knowledge, but small enough so that it stays focused. Often, three to six members is a good size.

Here are some ways to use this guide as part of a study group:

- **Plan the group's study program.** Parts of the study plan template, beginning on page 54, can help to structure your group's study program. By filling out the first five columns and sharing the worksheets, everyone will learn more about your group's mix of abilities and about the resources, such as textbooks, that members can share with the group. In the sixth column ("Dates I will study the content"), you can create an overall schedule for your group's study program.
- **Plan individual group sessions.** At the end of each session, the group should decide what specific topics will be covered at the next meeting and who will present each topic. Use the topic headings and subheadings in the Test at a Glance table on page 5 to select topics, and then select practice questions, beginning on page 32.
- **Prepare your presentation for the group.** When it's your turn to present, prepare something that is more than a lecture. Write two or three original questions to pose to the group. Practicing writing actual questions can help you better understand the topics covered on the test as well as the types of questions you will encounter on the test. It will also give other members of the group extra practice at answering questions.

- **Take a practice test together.** The idea of a practice test is to simulate an actual administration of the test, so scheduling a test session with the group will add to the realism and may also help boost everyone's confidence. Remember, complete the practice test using only the time that will be allotted for that test on your administration day.
- **Learn from the results of the practice test.** Review the results of the practice test, including the number of questions answered correctly in each content category. For tests that contain constructed-response questions, look at the Sample Test Questions section, which also contain sample responses to those questions and shows how they were scored. Then try to follow the same guidelines that the test scorers use.
- **Be as critical as you can.** You're not doing your study partner(s) any favors by letting them get away with an answer that does not cover all parts of the question adequately.
- **Be specific.** Write comments that are as detailed as the comments about the sample responses. Indicate where and how your study partner(s) are doing an inadequate job of answering the question. Writing notes in the margins of the answer sheet may also help.
- **Be supportive.** Include comments that point out what your study partner(s) got right.

Then plan one or more study sessions based on aspects of the questions on which group members performed poorly. For example, each group member might be responsible for rewriting one paragraph of a response in which someone else did an inadequate job.

Whether you decide to study alone or with a group, remember that the best way to prepare is to have an organized plan. The plan should set goals based on specific topics and skills that you need to learn, and it should commit you to a realistic set of deadlines for meeting those goals. Then you need to discipline yourself to stick with your plan and accomplish your goals on schedule.

5. Develop Your Study Plan

Develop a personalized study plan and schedule

Planning your study time is important because it will help ensure that you review all content areas covered on the test. Use the sample study plan below as a guide. It shows a plan for the *Core Academic Skills for Educators: Reading* test. Following that is a study plan template that you can fill out to create your own plan. Use the "Learn about Your Test" and "Test Specifications" information beginning on page 5 to help complete it.

Use this worksheet to:

1. **Define Content Areas:** List the most important content areas for your test as defined in chapter 1.
2. **Determine Strengths and Weaknesses:** Identify your strengths and weaknesses in each content area.
3. **Identify Resources:** Identify the books, courses, and other resources you plan to use for each content area.
4. **Study:** Create and commit to a schedule that provides for regular study periods.

Praxis Test Name (Test Code): Core Academic Skills for Educators: Reading (5712)

Test Date: 9/15/15

Content covered	Description of content	How well do I know the content? (scale 1–5)	What resources do I have/need for the content?	Where can I find the resources I need?	Dates I will study the content	Date completed
Key Ideas and Details						
Close reading	Draw inferences and implications from the directly stated content of a reading selection	3	Middle school English textbook	College library, middle school teacher	7/15/15	7/15/15
Determining Ideas	Identify summaries or paraphrases of the main idea or primary purpose of a reading selection	3	Middle school English textbook	College library, middle school teacher	7/17/15	7/17/15
Determining Ideas	Identify summaries or paraphrases of the supporting ideas and specific details in a reading selection	3	Middle and high school English textbook	College library, middle and high school teachers	7/20/15	7/21/15
Craft, Structure, and Language Skills						
Interpreting tone	Determine the author's attitude toward material discussed in a reading selection	4	Middle and high school English textbook	College library, middle and high school teachers	7/25/15	7/26/15
Analysis of structure	Identify key transition words and phrases in a reading selection and how they are used	3	Middle and high school English textbook, dictionary	College library, middle and high school teachers	7/25/15	7/27/15
Analysis of structure	Identify how a reading selection is organized in terms of cause/effect, compare/contrast, problem/solution, etc.	5	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/1/15	8/1/15
Author's purpose	Determine the role that an idea, reference, or piece of information plays in an author's discussion or argument	5	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/1/15	8/1/15

(continued on next page)

Content covered	Description of content	How well do I know the content? (scale 1–5)	What resources do I have/need for the content?	Where can I find the resources I need?	Dates I will study the content	Date completed
Language in different contexts	Determine whether information presented in a reading selection is presented as fact or opinion	4	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/1/15	8/1/15
Contextual meaning	Identify the meanings of words as they are used in the context of a reading selection	2	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/1/15	8/1/15
Figurative Language	Understand figurative language and nuances in word meanings	2	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/8/15	8/8/15
Vocabulary range	Understand a range of words and phrases sufficient for reading at the college and career readiness level	2	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/15/15	8/17/15
Integration of Knowledge and Ideas						
Diverse media and formats	Analyze content presented in diverse media and formats, including visually and quantitatively, as well as in words	2	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/22/15	8/24/15
Evaluation of arguments	Identify the relationship among ideas presented in a reading selection	4	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/24/15	8/24/15
Evaluation of arguments	Determine whether evidence strengthens, weakens, or is relevant to the arguments in a reading selection	3	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/27/15	8/27/15
Evaluation of arguments	Determine the logical assumptions upon which an argument or conclusion is based	5	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/28/15	8/30/15
Evaluation of arguments	Draw conclusions from material presented in a reading selection	5	High school textbook, college course notes	College library, course notes, high school teacher, college professor	8/30/15	8/31/15
Comparison of texts	Recognize or predict ideas or situations that are extensions of or similar to what has been presented in a reading selection	4	High school textbook, college course notes	College library, course notes, high school teacher, college professor	9/3/15	9/4/15
Comparison of texts	Apply ideas presented in a reading selection to other situations	2	High school textbook, college course notes	College library, course notes, high school teacher, college professor	9/5/15	9/6/15

My Study Plan

Use this worksheet to:

1. **Define Content Areas:** List the most important content areas for your test as defined in chapter 1.
2. **Determine Strengths and Weaknesses:** Identify your strengths and weaknesses in each content area.
3. **Identify Resources:** Identify the books, courses, and other resources you plan to use for each content area.
4. **Study:** Create and commit to a schedule that provides for regular study periods.

Praxis Test Name (Test Code): _____

Test Date: _____

Content covered	Description of content	How well do I know the content? (scale 1–5)	What resources do I have/need for this content?	Where can I find the resources I need?	Dates I will study this content	Date completed

(continued on next page)

6. Review Study Topics

Detailed study topics with questions for discussion

Using the Study Topics That Follow

The Pennsylvania Grades 4-8 Core Assessment test is designed to measure the knowledge and skills necessary for a beginning teacher.

This chapter is intended to help you organize your preparation for the test and to give you a clear indication of the depth and breadth of the knowledge required for success on the test.

Virtually all accredited programs address the topics covered by the test; however, you are not expected to be an expert on all aspects of the topics that follow.

You are likely to find that the topics below are covered by most introductory textbooks. Consult materials and resources, including lecture and laboratory notes, from all your coursework. You should be able to match up specific topics and subtopics with what you have covered in your courses.

Try not to be overwhelmed by the volume and scope of content knowledge in this guide. Although a specific term may not seem familiar as you see it here, you might find you can understand it when applied to a real-life situation. Many of the items on the actual test will provide you with a context to apply to these topics or terms.

Discussion Areas

Interspersed throughout the study topics are discussion areas, presented as open-ended questions or statements. These discussion areas are intended to help test your knowledge of fundamental concepts and your ability to apply those concepts to situations in the classroom or the real world. Most of the areas require you to combine several pieces of knowledge to formulate an integrated understanding and response. If you spend time on these areas, you will gain increased understanding and facility with the subject matter covered on the test. You may want to discuss these areas and your answers with a teacher or mentor.

Note that this study companion *does not provide answers for the discussion area questions*, but thinking about the answers to them will help improve your understanding of fundamental concepts and will probably help you answer a broad range of questions on the test.

Pedagogy Study Topics

The purpose of the Pedagogy section of the Core test (5153) is to assess whether the entry-level middle school teacher has the pedagogical knowledge that is important, necessary and needed at time of entry to the profession.

I. Adolescents as Learners

A. Adolescents' Development and the Learning Process

1. How young adolescents learn
2. Distinguishing characteristics of young adolescent development
3. Major contributions of foundational theorists to education
4. Terminology related to learning theories
5. The impact of learning theory on the instructional process for adolescents

Discussion areas

- How does knowledge of the learning process affect instruction and assessment planning?
- Describe the intellectual, physical, psychological, social, moral, and ethical developmental characteristics of adolescent development.
- How does development in one domain, such as intellectual, affect performance in another domain, such as social?
- What are typical and atypical variances within each domain of adolescent development?
- What are the theoretical contributions of important theorists such as Jerome Bruner, Jean Piaget, Benjamin Bloom, Howard Gardner, Lev Vygotsky, Abraham Maslow, and Eric Erikson?
- What are the implications of the work of Robert Marzano, Grant Wiggins, and Jay McTighe for curriculum development and instructional planning?

- What are the implications of the theory behind these terms for classroom application?
 - Metacognition
 - Schema
 - Transfer
 - Self-efficacy
 - Constructivism
 - Self-regulation
 - Zone of proximal development
 - Multiple intelligences
 - Assimilation, accommodation, adaptation
- What is an example of constructivism, and why is an understanding of constructivism important for instructional planning?
- What is the relationship between learning theory and adolescent development?

B. Adolescents as Diverse Learners

1. Variables that affect how adolescent students learn
2. The impact of individual differences on adolescent learning
3. Legislation relating to students with special needs
4. Traits, behaviors, and needs of students with special needs
5. The effect of English language acquisition on the educational experiences of adolescent English Language Learners
6. The effect of culture and gender on communication

Discussion areas

- How is an adolescent's learning influenced by individual experience and prior learning, as well as by language and family and community values?
- How do the differences in learning style affect how adolescents learn and perform?
- What does the research reveal about gender differences and how these differences might affect learning?
- What is an example of the way cultural expectations from a particular geographical region or ethnic group might affect how adolescents learn or express what they know?
- What are the major classroom and instructional issues related to each area of exceptionality (cognitive, auditory, visual, motor/physical, speech/ language, social/ emotional, and behavioral)?

- How do these exceptionalities impact adolescents' learning?
- What are the provisions of the Americans with Disabilities Act (ADA), the Individuals with Disabilities Act (IDEA), Section 504 of the Rehabilitation Act, and PA Chapters 14 and 16?
- How do the provisions of legislation affect classroom practice? Consider adaptations, modifications, inclusion, documentation, and accommodations.
- What are the traits, behaviors, and needs of students identified with special needs, such as gifted students or students with ADD, ADHD, autism, dyslexia, or an emotional, physical, and/or learning disability?
- How does the process of English language acquisition affect the educational experiences of adolescent English Language Learners?
- What are strategies to support the learning of adolescents for whom English is not a first language?
- What is the impact of an adolescent's culture and gender on verbal and nonverbal communication?
- What are specific examples of gestures and other body language that have different meanings in different cultures?

C. Student Motivation and the Learning Environment

1. The implications of foundational motivation theories for instruction, learning, and classroom management
2. Research-based strategies for classroom management
3. Strategies for establishing a positive, respectful, and nurturing learning environment
4. Strategies to support the development of motivation in young adolescents

Discussion areas

- Describe the following terms related to foundational motivation theories:
 - Self-determination
 - Attribution
 - Extrinsic/intrinsic
 - Constructivism
 - Cognitive dissonance
 - Student engagement
 - Positive and negative reinforcement
- What are the implications of motivation theories for instruction, learning, and classroom management?
- What are some factors that would likely promote or diminish students' motivation to learn?
- What are effective methods for developing classroom routines, procedures, and standards of conduct, for maintaining accurate records, and for arranging classroom space?
- What are effective methods for developing a positive classroom environment?
- What are effective strategies for developing a learning community that respects the diversity of students?
- How does a teacher help adolescents develop self-motivation?

II. Curriculum and Instruction

A. Planning Instruction

1. The impact of national and state content standards on instructional planning
2. The basic concepts of educational theories when planning instruction
3. The effect of scope and sequence on instructional planning
4. The integrative nature of subject matter
5. The selection of content to achieve unit and lesson objectives
6. The development of instructional objectives
7. The role of resources and materials in planning instruction
8. Resources to meet adolescents' diverse learning needs
9. Lesson development as part of thematic, integrative, specific, and/or interdisciplinary units
10. Collaborative processes for instructional planning
11. Short- and long-term planning techniques
12. Planning instruction based on adolescents' prior knowledge

Discussion areas

- How do standards inform instructional planning?
- What relevant resources might a teacher use to implement standards-aligned instruction?
- What are the major differences between cognitivism, constructivism, and behaviorism?
- How does social learning theory influence instructional planning?
- How is a strategic learning classroom different from a traditional classroom?
- How does a teacher translate curriculum goals and discipline-specific scope and sequence frameworks into units and lessons?
- What are the connections among subject matter disciplines, and what are the implications for student learning?
- What must a teacher consider when selecting the content to achieve lesson and unit objectives?
- What are the differences among the cognitive, affective, and psychomotor learning domains?

- What is an example of a cognitive, affective, and psychomotor instructional objective?
- How do resources (including, but not limited to, the following) support learning?
 - Library collection
 - Videos
 - Artifacts, models, manipulatives
 - Adaptive and assistive technology
 - Guest speakers
- What should a teacher consider when planning to incorporate various resources into lesson planning?
- How might technology be integrated into classroom instruction?
- How does technology support learning?
- What resources are useful for addressing the varied needs of young adolescent students?
- What are the basic concepts of thematic instruction?
- What are the components of thematic, integrative, and interdisciplinary units?
- Describe the role grade-level team members, specialists, special education teachers, instructional coaches, and paraprofessionals play in instructional planning.
- What are the differences in planning for a lesson, a unit, a term, a semester, or a year?
- Describe the importance of benchmarks in the planning process.
- How does prior knowledge influence learning?
- Describe strategies for activating students' prior knowledge.

B. Instructional Strategies

1. The distinguishing characteristics of instructional models to support young adolescent learning
2. Strategies to encourage complex cognitive processes
3. Strategies to promote young adolescents' development of self-regulatory skills
4. Advantages and disadvantages of different group configurations for learning
5. Teaching to an instructional objective
6. Monitoring and adjusting instruction in response to student feedback
7. The role of teachable moments in instruction

8. Strategies for reflecting upon, analyzing, and evaluating the effectiveness of instruction
9. Research-based questioning techniques

Discussion areas

- What are the distinguishing characteristics of the following instructional models?
 - Direct
 - Indirect
 - Independent
 - Experiential and virtual
 - Interactive
- What instructional strategies are associated with each model?
- How does a teacher determine the appropriate instructional model to achieve a learning objective?
- What characterizes cognitive processes (including, but not limited to, the following)?
 - Concept learning
 - Problem solving
 - Metacognition
 - Critical thinking
 - Creative thinking
 - Transfer of learning
- What are some ways that teachers can stimulate the development of cognitive processes (including, but not limited to, the following) in a lesson or unit?
 - Distinguishing fact from opinion
 - Comparing
 - Detecting bias
 - Predicting
 - Categorizing
 - Analyzing
 - Sequencing
 - Summarizing
 - Inferring
 - Decision making
 - Evaluating
- How do instructional strategies (including, but not limited to, the following) support adolescents' learning and behavior?
 - Modeling
 - Independent practice
 - Scaffolding
 - Differentiating
 - Guided practice
 - Peer tutoring
 - Intervention
 - Mediation
- What are some advantages and disadvantages of the following grouping configurations?
 - Whole class
 - Small group
 - Independent
 - One-on-one
 - Pairs/triads/quads
- What are some examples of appropriate situations for grouping students heterogeneously?
- What are some examples of appropriate situations for grouping students homogeneously?
- Besides grouping students by performance level, what other factors should a teacher consider when grouping students?
- Describe the steps involved in teaching to an objective.
- What strategies might a teacher employ to monitor student understanding as a lesson unfolds?
- How does a teacher know whether to re-teach a topic, move more quickly, or go back to material previously addressed?
- Define a teachable moment and describe the impact on learning.
- Why reflect? What are strategies that facilitate reflective practice?
- Describe how questioning techniques and strategies influence student learning.
- How might a teacher promote critical thinking among students?
- What does research suggest about wait time?
- When asking questions, what is the difference between prompting and probing?
- What is an example of a question in a particular content area that probes for understanding?
- How does a teacher dignify an incorrect student response?
- What types of questions would encourage divergent thinking on a particular topic?

C. Communication Techniques

1. Verbal and nonverbal communication techniques (including, but not limited to, the following)
2. Research-based techniques to promote communication
3. Instructional strategies to support literacy development across the curriculum

Discussion areas

- How might a teacher use voice and tone to affect learning?
- What are some examples of nonverbal communication?
- What are some ways a teacher can use nonverbal communication techniques to affect learning?
- What are some classroom activities that promote communication by an individual student or among students?
- What characterizes active listening?
- How does a teacher promote active listening in the classroom?
- What literacy across the curriculum strategies might a teacher incorporate in a lesson to support students?
 - Understanding of text structure?
 - Comprehension of text?
 - Acquisition of vocabulary?

III. Assessment**A. Types of Assessment**

1. The distinctions among different forms of assessment
2. The role of formal and informal assessments to guide instruction
3. The different purposes of standardized tests
4. The difference between norm-referenced and criterion-referenced tests
5. The rationale for using student self-assessment and peer assessment

Discussion areas

- What are the distinguishing characteristics of the following forms of assessment?
 - Traditional
 - Authentic
 - Portfolio
 - Exhibition
 - Open-ended
 - Alternative
 - Standardized
- What are the characteristics, uses, advantages, and limitations of formal and informal assessment?
- Describe the purposes of standardized tests, and identify the data derived from the different types:
 - Achievement tests
 - Aptitude tests
 - Ability tests
- How are criterion-referenced tests and norm-referenced tests similar and different?
- How do self-assessment and peer assessment promote learning?

B. Assessment Data

1. The concept of data-informed decision making
2. Communicating the meaning of assessment results

Discussion areas

- Define the concept of data-informed decision making and its value for teaching and learning.
- Describe what scores and testing data indicate about a student's ability, aptitude, or performance.
- What considerations must a teacher make when communicating assessment results to students? To parents?

C. Assessment Design and Tools

1. The design of assessments that target standards and academic anchors in subject areas
2. The terminology related to scoring
3. Selecting assessments to measure student mastery of learning goals and objectives

Discussion areas

- Describe assessment formats (including, but not limited to, the following):
 - Essay
 - Selected response
 - Portfolio
 - Conference
 - Observation
 - Performance
- What characterizes raw score, scaled score, percentile, grade-equivalent scores, and age-equivalent scores?
- What is the difference between analytic scoring and holistic scoring?
- When might a teacher use holistic scoring to assess student work?
- Identify the uses, strengths, and limitations of the following assessment tools:
 - Rubrics
 - Analytic checklists
 - Scoring guides
 - Anecdotal notes
 - Continuums
 - Technology
- What criteria must a teacher consider when selecting an appropriate assessment to measure student learning?

IV. Professionalism**A. Philosophy and Organization**

1. The rationale and purpose of middle level schooling
2. Middle level philosophy
3. Middle level trends and issues
4. The organizational features of middle level schools
5. Developmentally responsive middle level school practices

Discussion areas

- Why middle level schooling?
- Define the philosophical foundation of developmentally responsive middle level programs and schools.
- What are the social issues within school or in the environment outside of school that may influence adolescents' lives and learning?
- How do economic trends and political issues affect education?
- Define the characteristics of developmentally responsive middle level schools.
- Explain how best practices meet the needs of young adolescents:
 - Exploratory
 - Interest/mini-courses
 - Intramurals
 - Flexible grouping
 - Interdisciplinary curriculum
 - Transitional planning

B. Professional Development

1. Professional development practices and resources
2. Research on curriculum, assessment, and instruction
3. The value of reflective practice for professional growth

Discussion areas

- How do the following resources support educators?
 - Professional literature
 - Professional associations
 - Workshops
 - Conferences
 - Learning communities
 - Graduate courses
 - Independent research
 - Induction programs
 - Study groups
 - Webinars
- How does research inform educational practices?
- Why engage in reflective practice?
- What are some activities that support reflective practice?

C. Professional Practices

1. The impact of federal, state, and local legislation or court decisions on education
2. The role of teachers as educational leaders in the greater community
3. The value of and strategies for developing collaborative relationships to support the educational process

Discussion areas

- Define the implications of the following legislative acts or court decisions for students and teachers:
 - Equal access
 - Family Educational Rights and Privacy Act
 - First Amendment issues
 - Intellectual freedom
 - Child neglect and abuse reporting
 - Due process
 - Liability
 - Licensing and tenure
 - Copyright
 - Student-assistance programs
- How do educators shape and advocate for the profession?
- Why is it important for a teacher to develop collaborative relationships with colleagues, administrators, other school personnel, parents, and community members?
- What are the elements of successful collaboration?

English Language Arts Study Topics

The purpose of the English Language Arts section of the Core test (5154) is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary and needed at time of entry to the profession to teach English language arts.

I. English Language Arts

This section of the test focuses on reading skills and basic knowledge about literary interpretation. No previous experience with the supplied passages is required.

A. Reading

1. Informational text (print and other media)
 - a. understands how to interpret informational texts
 - comprehend the literal meaning of a passage
 - draw inferences from a passage
 - summarize or paraphrase the main idea(s) and supporting details within a passage
 - compare and contrast two or more texts
 - analyze text features (e.g., headings, charts, sidebars)
 - distinguish among forms of text organization (e.g., cause and effect, sequential order, problem-solution)
 - b. understands the use of critical thinking in informational text
 - differentiate between facts and opinions
 - identify biases, fallacies, stereotypes, and assumptions
 - explain how biases, fallacies, stereotypes, and assumptions can affect intended meaning
 - identify propaganda techniques (e.g., bandwagon, emotional appeal, testimonial) in informational texts

Discussion areas

- Find an example of each of the common forms of organization for informational texts. For each example, paraphrase the main idea and one supporting detail.
- Explain how stereotypes and biases can interfere with constructing persuasive arguments.

2. Literature
 - a. understands how to interpret literature
 - comprehend the literal meaning of a passage
 - draw inferences from a passage
 - summarize or paraphrase the main idea(s) and supporting details within a passage
 - identify theme(s) in a passage
 - compare and contrast two or more texts within and across genres
 - identify literary elements (e.g., setting, plot, characterization)
 - b. knows major literary genres
 - describe the characteristics of each major literary genre (e.g., poetry, fiction, drama)
 - c. understands figurative language
 - explain the major types of figurative language (e.g., simile, metaphor, personification)
 - interpret figurative language used within a text

Discussion areas

- Choose a poem or short story by an author whose work is commonly taught in middle school, such as Lois Lowry, Edgar Allan Poe, or Gary Soto. Paraphrase a few lines or sentences from the work and identify one or more of its themes.
- Analyze how the form of each major literary genre affects its content.
- Find an Emily Dickinson poem that includes an example of a metaphor, simile, or personification. Explain the meaning of the example in the context of the poem.

B. Writing

This section of the test focuses on the basic knowledge needed to produce effective writing.

1. Types of writing
 - a. understands the use of different types of writing
 - describe and differentiate among the types of writing: narrative, persuasive, informational
 - determine when to use each type of writing

- b. knows the author's purpose and role of the audience
 - identify the author's purpose
 - identify the intended audience of a work
 - determine when to use formal vs. informal language

Discussion areas

- Identify one example of each type of writing named above—narrative, persuasive, and informational—and explain what differentiates it from the other two types.
 - Describe one purpose and audience for which a persuasive piece written in informal language would be appropriate.
2. Quality of writing
 - a. understands the domain of organization
 - describe organization within and across paragraphs
 - identify examples of organizational features in writing (e.g., appropriate transitions, introduction, body, conclusion)
 - b. understands the domains of content and focus
 - identify a thesis statement within a text
 - identify evidence supporting the thesis within a text
 - evaluate a text's thesis and support to ensure logical connections
 - c. understands the domain of conventions
 - apply standard use of capitalization and punctuation
 - apply standard English usage (e.g., subject-verb agreement, pronoun agreement, tense consistency)
 - identify complete sentences

Discussion areas

- From a middle school text in your major field, identify the introduction, body, and conclusion of a paragraph, and any transitional words or phrases.
- From middle school texts in your major field, identify two paragraphs that have a clear thesis statement and one that has an implied thesis statement. In your own words, write the implied thesis statement.
- Find and revise examples of comma splices, sentence fragments, and subject-verb agreement errors.

3. Writing process
 - a. knows common approaches to composition
 - describe the stages of the writing process (e.g., planning, drafting, editing)
 - apply revision techniques

Discussion areas

- Identify two research-based strategies for each of the following stages of the writing process: planning, drafting, and editing.
4. Research
 - a. knows common research techniques
 - identify relevant information from multiple print and non-print sources
 - determine the credibility and accuracy of source materials
 - differentiate between primary and secondary sources
 - identify documentation techniques when quoting or paraphrasing source materials to avoid plagiarism
 - identify parts of a bibliographic citation

Discussion areas

- Identify three common challenges middle school students face when conducting research for a writing assignment. Explain how you would address each of these challenges in your teaching.

Social Studies Study Topics

II. Social Studies

The purpose of the Social Studies section of the English Language Arts and Social Studies Core test (5154) is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary and needed at time of entry to the profession to teach social studies.

A. United States History

1. Knows basic North American geography and the peoples and cultures of North America prior to European colonization
 - a. locates major geographical features (mountain ranges, lakes, rivers, valleys)
 - b. knows differences in climate and vegetation across the regions
 - c. describes major features of various Indian groups (e.g., Eastern Woodlands, Great Plains)
2. Knows the origins and development of the thirteen colonies and the early Republic
 - a. identifies reasons for settlement
 - b. describes the evolution of the English colonies
 - c. knows causes and results of the American Revolution
 - d. identifies leaders and major turning points of the American Revolution
 - e. knows basic tenets of the Declaration of Independence
 - f. demonstrates knowledge of the early government of the United States prior to the Constitution
3. Is familiar with major political developments throughout United States history
 - a. development of political parties
 - b. Jacksonian era
 - c. Gilded Age
 - d. progressive era
 - e. New Deal
 - f. political issues of the 1940-90s (e.g., McCarthyism, Civil Rights movements, student protest movements, Watergate)
4. Knows about nineteenth-century sectionalism, the Civil War, and Reconstruction
 - a. demonstrates knowledge of:
 - economic and cultural divide between North and South
 - events leading to the Civil War
 - b. identifies leaders and major turning points of the Civil War
 - c. knows major causes and effects of Reconstruction
5. Knows the impact of racial, gender, and ethnic interactions throughout United States history
 - a. demonstrates knowledge of racial issues throughout United States history (e.g., slavery, Japanese internment, struggles for civil rights)
 - b. demonstrates knowledge of gender issues throughout United States history (e.g., woman suffrage, feminist movement)
 - c. demonstrates knowledge of key individuals in struggles for civil rights (e.g., Elizabeth Cady Stanton, Martin Luther King, Jr., Cesar Chávez).

6. Knows major cultural and social developments in United States history
 - a. social reform and educational reform movements (e.g., abolitionism, temperance)
 - b. religious movements (e.g., Second Great Awakening)
 - c. industrialization and urbanization
 - d. major social and cultural trends of the twentieth century (e.g., counterculture, consumerism)
 - e. the impact of changing roles of women, men and the family in United States history
7. Knows about territorial expansion and the emergence of the United States as a world power
 - a. demonstrates knowledge of western acquisitions (e.g., Louisiana Purchase)
 - b. demonstrates knowledge of military actions (e.g., Spanish-American War, First and Second World War)
8. Knows major economic transformations (e.g., in agriculture, in business, and in labor) in the United States
 - a. demonstrates knowledge of economic cycles of boom and bust in United States history
 - b. demonstrates knowledge of the long-term changes from an agricultural economy to an industrial economy to a post-industrial economy in United States history
9. Knows changing patterns of immigration to the United States and internal migration within the United States
 - a. demonstrates knowledge of major shifts in the sources of immigration to the United States
 - b. demonstrates knowledge of the impact of immigration and migration within the United States
10. Knows the interpretations and ongoing impact of the United States Constitution
 - a. is familiar with landmark Supreme Court cases:
 - *Dred Scott case (Dred Scott v. Sandford)*
 - *Brown v. Board of Education of Topeka*
 - *Marbury v. Madison*
 - *Miranda v. Arizona*
 - b. demonstrates knowledge of the Constitution and Bill of Rights
11. Knows major developments of Pennsylvania history
 - a. knows major social, political, cultural, and economic developments throughout Pennsylvania history
 - b. knows major historical figures and their contributions to Pennsylvania history until 1824 (e.g., William Penn, Benjamin Franklin)
 - c. knows major historical sites in Pennsylvania (e.g., Gettysburg, Philadelphia, Pittsburgh)
 - d. is familiar with the history of Pennsylvania's ethnic groups

Discussion areas

- Compare how different Native American groups adapted to and changed their environments.
- Identify reasons certain groups supported or opposed the Revolutionary cause.
- Describe the social, political and economic characteristics of each of the eras listed.
- Describe the economic and social differences between the North and the South in the period leading up to the Civil War.
- Describe major accomplishments in the advancement of civil rights for different groups throughout United States history (e.g. the Nineteenth Amendment, The Voting Rights Act of 1965).
- Describe the factors that led to suburbanization and the growth of consumerism in the United States in the 1950s.
- Define Manifest Destiny and describe major acquisitions of land in United States history.
- Describe the major developments in transportation throughout United States history and their cultural and economic impacts (e.g., the impact of the transatlantic railroad on business, communication and travel).
- Describe the major shift in immigration to the United States in the late 1800s and describe the experience of immigrants entering the United States during this period.
- Describe the issues raised by each of the above cases and explain the Court's ruling in each.

- Describe the motivations for the settlement of Pennsylvania and the major historical figures who contributed to the political and cultural development of the state.

B. World History

1. Is familiar with the major contributions of early civilizations in Africa, Europe, Asia and the Americas, such as long-term impact on science, philosophy, art, religion, governance
 - a. is familiar with the contributions of early river-valley civilizations (e.g., Egyptian, Mesopotamian, Chinese Dynasties)
 - b. is familiar with contributions of major civilizations in the Americas (e.g., Aztecs, Incas, Mayans)
2. Is familiar with the major contributions of the classical civilizations of Greece and Rome
3. Is familiar with growing global interactions in the period 1200 to 1900 C.E.
 - a. is familiar with the global transition to a market economy
 - b. is familiar with cultural contacts among Europe, Asia, Africa, and the Americas (e.g., Columbian Exchange, colonization, the Plague)
4. Is familiar with causes and effects of the First and Second World Wars and the Cold War (e.g., Russian Revolution, decolonization)
 - a. is familiar with major causes and effects of the First World War, Second World War and Cold War
5. Is familiar with globalization
 - a. identifies examples of globalization
6. Is familiar with how technological innovations have shaped world societies
 - a. is familiar with the development and diffusion of long-range communication, transportation and tools
7. Is familiar with basic tenets of major world religions
 - a. is familiar with major world religions (e.g., Hinduism, Buddhism, Islam, Christianity and Judaism)
8. Is familiar with major economic transformations that have affected world societies (e.g., spread of the market economy, industrialization)
 - a. is familiar with how industrialization has affected world societies since the Industrial Revolution
 - b. is familiar with how the spread of the market economy has affected world societies
9. Is familiar with major demographic trends in world history
 - a. is familiar with how the development of agriculture has impacted demographic trends
 - b. is familiar with the demographic effects of industrialization and urbanization

Discussion areas

- Identify contributions of each of the civilizations mentioned.
- Compare and contrast the similarities and differences between Greece and Rome.
- Describe the Columbian exchange and identify the origins and destinations of each of the major animal species, plant species and pathogens exchanged.
- Describe how the Treaty of Versailles and associated treaties created political instability in post-First World War Europe.
- Define globalization and identify one economic and one cultural example of globalization.
- Describe the impact of domestication of plants and animals and diffusion of agriculture on world societies.
- Identify similarities and differences among Judaism, Christianity and Islam.
- Analyze the social and cultural impacts of industrialization (e.g., urbanization, migration patterns, gender roles).
- Analyze the main reasons for the continued shift of world populations to urban areas in the 1800s and 1900s.

C. Government/Political Science

1. Knows the key concepts and ideas on which the United States government is based
 - a. demonstrates knowledge of how key concepts (e.g., popular sovereignty, separation of powers, checks and balances) shaped the framing of the Constitution and the United States government
2. Knows about federalism and the basic relationship between the states and the national government
 - a. defines federalism and its impact on governance in the United States
 - b. demonstrates knowledge of the relationships among federal and state governments
3. Knows the roles and interactions of the three branches of the federal government
 - a. demonstrates knowledge of the functions and powers of the legislative, executive, and judicial branches of government
 - b. demonstrates knowledge of the relationships among the legislative, executive, and judicial branches of government
4. Knows how the election process operates in the United States
 - a. demonstrates knowledge of the Electoral College and its role in elections (e.g., the role of the popular vote)
 - b. demonstrates knowledge of characteristics of the election process (e.g., nominating, campaigning, fundraising)
5. Knows the rights, responsibilities, and duties of citizens
 - a. demonstrates knowledge of civic participation (e.g., community service, membership in civic organizations)
 - b. demonstrates knowledge of the rights and responsibilities (e.g., petition, voting, paying taxes) of United States citizens
 - c. demonstrates knowledge of the application of constitutional rights in American society (e.g., free speech)

6. Is familiar with the basic characteristics of major political systems
 - a. is familiar with the structure of differing political systems (e.g., democracy, monarchy, theocracy)
7. Knows about Pennsylvania state government
 - a. knows the principles, structure and operation of Pennsylvania state government

Discussion areas

- Identify examples of checks and balances or separation of powers in the provisions of the Constitution.
- Identify which powers are delegated to the federal government and which powers are delegated to the states.
- Compare the role the three branches of government would play in addressing a particular societal issue.
- Describe the major steps in the election process and identify ways the process has changed over time (e.g., emergence of the internet).
- Identify the major rights granted to citizens of the United States and identify examples of the expansion of civil rights over time.
- Compare and contrast major features of a parliamentary system of government with a presidential system.
- Describe the structure of the government of Pennsylvania (e.g., features of the state legislature and the state court system).

D. Economics

1. Is familiar with basic principles of economics
 - a. defines economics
 - b. is familiar with basic economic principles (e.g., scarcity, choice, competition, allocation of resources, supply and demand)
2. Is familiar with basic principles of personal finance
 - a. is familiar with the principles of budgeting, credit, and savings
 - b. is familiar with basic investment tools (e.g., stocks and bonds)

3. Is familiar with how the factors of production affect economic activity
 - a. is familiar with how the factors of production (i.e., land, labor, capital, and entrepreneurship) affect economic activity

Discussion areas

- Explain the basic economic problem of limited resources and unlimited wants and describe how this basic problem impacts factors such as choice and supply and demand.
- Analyze the correlation of potential risk and reward for various financial instruments (e.g., savings accounts, equities, government bonds, junk bonds).
- Choose a product or service and analyze the various specific factors of production that went into creating it.

E. Geography

1. Is familiar with spatial patterns and their meanings (e.g., population density, resource distribution)
 - a. recognizes spatial patterns (e.g., of people, places, and environments)
 - b. describes patterns at any given scale
2. Is familiar with the use of characteristics (e.g., climate, location, culture) to identify regions
 - a. is familiar with the creation and uses of regions to interpret Earth's complexity (e.g., rain forest, Africa, Middle East)
 - b. identifies regions based on cultural and physical characteristics
3. Knows the interaction between the environment and human activity
 - a. demonstrates knowledge of how human actions modify the physical environment
 - b. demonstrates knowledge of how physical environments affect human activities (e.g., transportation systems, communication systems, trade)
4. Understands the concepts of absolute and relative location
 - a. demonstrates an understanding of latitude and longitude and applies them to determine absolute location on a map
 - b. demonstrates understanding of and ability to use the concepts of absolute and relative location
 - c. demonstrates understanding of cardinal and intermediate directions
5. Knows the location of prominent geographic features around the world (e.g., oceans and continents)
 - a. identifies the location of oceans, continents, major rivers, and major physical features (e.g., Amazon River, Himalayas)

Discussion areas

- Compare how state-level and county-level maps of the same data change the way it can be interpreted.
- Identify an example of a cultural region and a physical region. Describe the characteristics used to define the regions you identify (e.g., ethnicity, language, climate).
- Analyze the effects of current or historical human modifications of the environment (e.g., forest clearance, fossil fuel use, urbanization).
- Choose several locations around the world (e.g., country, city, landform) and describe their absolute and relative locations.
- Study a world map or globe to locate prominent geographic features.

Mathematics Study Topics

The purpose of the Mathematics section of the Mathematics and Science Core test (5155) is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary and needed at time of entry to the profession to teach mathematics.

The types of understanding that must be demonstrated by those who pass this part of the test, along with the component skills associated with each type of understanding, are outlined below. After many of the lists of component skills is a study question in italics that might be helpful in preparing for the test.

I. Mathematics

A. Numbers and Operations

1. Understands basic operations and properties of rational numbers.
 - a. solve problems involving addition, subtraction, multiplication, and division of rational numbers
 - b. apply the order of operations
 - c. use place value to read and write numbers in standard and expanded form
 - d. identify or apply properties of operations on a number system (i.e., commutative, associative, distributive, identity)
 - e. order positive and negative integers
 - f. perform operations involving positive exponents
2. Understands the relationships among fractions, decimals, and percents.
 - a. simplify fractions to lowest terms
 - b. find equivalent fractions
 - c. convert among fractions, decimals, and percents
 - d. represent fractions, decimals, and percents with various models
 - e. compare positive rational numbers written as fractions and/or decimals
3. Knows how to use ratios and proportional relationships in solving problems.
 - a. apply the concept of a ratio to describe a relationship between two quantities
 - b. given a ratio, use a proportion to solve a problem
 - c. solve percent problems involving discounts, taxes, gratuities, and simple interest rates
4. Knows the basic concepts of number theory.
 - a. apply characteristics of prime and composite numbers
 - b. apply characteristics of odd or even numbers
 - c. solve basic problems involving factors or multiples
5. Knows how to use estimation to determine the reasonableness of results.
 - a. demonstrate an understanding of estimation and rounding
 - b. recognize appropriate uses of estimation and rounding

Discussion areas

- Be able to correctly solve problems involving the basic operations, including problems with fractions. For example, do you know that $2 + 5 \times 7 = 2 + 35 = 37$?
- Can you describe common mistakes students make in performing basic operations, including problems with fractions?
- Do you know what order of operations your calculator uses?
- Translate between forms of whole numbers (e.g., standard form, expanded form).
- Can you give examples of when one form of a number might be more useful in developing deeper understanding of mathematical concepts?
- Identify proper uses of the commutative, associative, distributive, and identity properties.
- Identify and determine additive and multiplicative inverses of numbers.
- Be able to recognize and use multiple representations of fractions, decimals, and percents.
- Can you give examples of when one form of a number might be more useful in developing deeper understanding of mathematical concepts?
- Can you describe several real-world applications of proportional reasoning?
- Use unit rates, scale factors, map legends, etc., to solve problems.
- Can you calculate the percent of a number and use it to solve problems?

- Can you describe at least one common mistake that middle school students make when calculating percents?
- Can you find prime factorizations, greatest common factors, and least common multiples?
- Can you describe real-world contexts where these concepts might be used?

B. Algebra

1. Knows how to translate verbal relationships into algebraic expressions and equations.
 - a. translate verbal relationships into algebraic equations or expressions
2. Understands how to solve equations.
 - a. use variables to construct and solve equations
3. Knows how to recognize and represent simple sequences or patterns.
 - a. describe or extend patterns involving numbers, shapes, or figures
 - b. form rules based on given patterns
 - c. identify patterns based on given rules

Discussion areas

- Can you translate verbal expressions and relationships into algebraic expressions or equations and vice versa?
- Be able to solve a linear equation for a given variable.
- Be able to find the solution of a system of equations.
- Can you write a formula to represent a pattern and use it to solve problems?
- Can you extend a sequence to find a later term in the sequence?

C. Functions and Their Graphs

1. Understands how to evaluate functions for given input values.
 - a. evaluate functions for given input values (i.e., algebraically, graphically, tabular)
2. Understands the components of the coordinate plane.
 - a. identify the x-axis, the y-axis, the origin, and the four quadrants in the coordinate plane
3. Knows how to graph ordered pairs on the coordinate plane.
 - a. identify and label ordered pairs on the coordinate plane

4. Knows how to analyze and create functions that model given information.
 - a. determine whether particular mathematical models (i.e., graph, equation, table) match given sets of conditions

Discussion areas

- Evaluate functions in which the relationship is presented in an algebraic equation, a graph, or in a table.
- Be able to match a given set of conditions with an appropriate graph, equation, or table.

D. Geometry and Measurement

1. Knows how to solve problems involving perimeter, area, and volume.
 - a. solve problems involving perimeter of polygons
 - b. solve problems involving area of triangles, quadrilaterals, and polygons composed of triangles and quadrilaterals
 - c. solve problems involving volume of cubes and rectangular prisms
 - d. use correct labels for dimensions in problems involving perimeter, area, and volume
2. Is familiar with similarity and congruence.
 - a. use similarity to solve problems with polygons
 - b. use congruence to solve problems with polygons
3. Knows how to solve problems involving circles.
 - a. solve problems involving circumference and area of circles
 - b. solve problems involving diameter and radius of circles
4. Knows properties of polygons.
 - a. solve problems involving triangles
 - b. identify geometric properties of various quadrilaterals
 - c. identify relationships among quadrilaterals
 - d. interpret and solve problems involving transformations on the coordinate plane
 - e. identify the lines of symmetry in a polygon

5. Knows properties of and relationships among points, lines, line segments, and rays.
 - a. identify points, lines, line segments, and rays
 - b. identify parallel and perpendicular lines
6. Understands systems of measurement.
 - a. solve measurement and estimation problems involving time, length, volume, and mass in both United States customary and metric systems
 - b. convert units within the United States customary system or the metric system.
 - c. use appropriate units of measurement in a given context

Discussion areas

- Be able to compute and apply basic formulas for perimeter and area of various figures.
- Can you find the area of a square when its perimeter is given?
- Can you describe real-life applications that involve finding perimeter, area, or volume?
- Do you recall that corresponding sides of similar polygons are proportional?
- Can you find the length of side DF if triangle ABC is similar to triangle DEF and $AC = 8$, $AB = 12$, and $DE = 4$?
- Be able to compute and apply basic formulas for finding circumference, area, diameter, or radius of a circle.
- Do you recall the different types of triangles, such as isosceles, equilateral, scalene, acute, right, and obtuse?
- Be able to find missing lengths of sides or measures of angles in triangles.
- Do you recall the triangle inequality theorem?
- Be able to identify and use special characteristics of a square, rectangle, rhombus, parallelogram, or trapezoid to solve problems involving lengths of sides and measures of angles.
- Be able to recognize distinctions among the different types of quadrilaterals.
- Be able to reflect, rotate, and translate figures in the xy -plane.
- Be able to identify images of points that have been reflected, rotated, and/or translated in the xy -plane.

- Be able to solve measurement problems in context.
- Use provided conversion factors and/or formulas to solve measurement problems.
- Can you convert centimeters to meters, inches to feet, and hours to seconds?

E. Probability, Statistics, and Discrete Math

1. Understands basic computations in statistics (i.e., mean, median, mode, range).
 - a. determine the mean, median, mode, and range of a given data set
 - b. choose an appropriate measure of central tendency to represent a given data set
2. Knows how to analyze and interpret data presented in tables, charts, and graphs.
 - a. analyze and interpret bar graphs, line graphs, circle graphs, pictographs, tables, charts, and tallies
 - b. identify outliers in a data set
3. Knows how to determine the probability of simple events.
 - a. find experimental probabilities using data collections, experiments, and simulations
 - b. find theoretical probabilities of simple events
4. Is familiar with logical reasoning.
 - a. determine the truth of if-then statements
 - b. use if-then statements to construct simple valid arguments
 - c. draw inductive and deductive conclusions within mathematical contexts

Discussion areas

- Be able to find and interpret common measures of central tendency.
- Do you know which measure of central tendency is best for a given set of data or given situation?
- Can you decide which form of representation is appropriate for different purposes and explain why the choice is appropriate?
- Be able to make appropriate conclusions using given information.

Science Study Topics

The purpose of the Science section of the Mathematics and Science Core test (5155) is to assess whether the entry-level middle school teacher has the content knowledge that is important, necessary and needed at time of entry to the profession to teach general science.

II. Science

A. Scientific Inquiry, Methodology, Techniques, and History

1. Elements of scientific inquiry and how they are used
 - a. identify observations, hypotheses, experiments, conclusions, theories, and models
 - b. critique basic experimental design and identify variables, controls, and sources of error
 - c. describe the nature of scientific knowledge (e.g., subject to change, consistent with evidence, a human endeavor)
 - d. identify unifying concepts and processes (e.g., systems, models, constancy and change, equilibrium, form and function)
2. Common methods and tools used to gather reliable data
 - a. appropriate use of common tools, such as thermometers, microscopes, barometers, and graduated cylinders
 - b. basic scientific units of measurement, such as length, distance, time, mass, volume, and temperature scales
 - c. common prefixes for measurement units, such as milli or kilo
3. Interpretation of scientific data presented in various forms (e.g., tables, graphs, maps, charts)
 - a. recognize patterns
 - b. draw basic conclusions
 - c. make predictions
 - d. identify significant points or regions on graphs
4. Important scientific developments and the contributions of major historical figures
 - a. identify major historical figures who contributed to the development of current scientific knowledge (e.g., Darwin, Newton, Galileo)

Discussion areas

- How are control variables and experimental variables used in scientific investigations?
- The experimental values obtained for the boiling point of three samples of distilled water were 93°C, 91°C, and 88°C. What are the possible sources of error in the experiment if the accepted value for the boiling point of water is 100°C?
- How has scientific work been built on earlier knowledge over the centuries?
- For what is a graduated cylinder used?
- What unit is equivalent to 1/1,000th of a gram?
- What graphical method would be most suitable for illustrating the relative amounts of solid waste that are recycled, incinerated, and disposed of in landfills?

B. Physical Sciences

1. Basic relationships between energy and matter
 - a. conservation of matter in chemical processes and phase changes
 - b. conservation of energy and energy transformations (e.g., potential to kinetic, light to heat)
 - c. different forms of energy, such as kinetic, potential, thermal, light, and electrical
 - d. heat transfer by conduction, radiation, and convection
 - e. properties of solids, liquids, and gases
 - f. changes of state in matter, such as melting, evaporating, condensing
 - g. basic concepts of chemistry
 - h. basic atomic structure, including nucleus, protons, electrons, neutrons
 - i. identify physical properties of substances, such as density, melting points, ability to conduct heat, ability to conduct electricity
 - j. chemical versus physical changes (e.g., iron rusting, water boiling)
2. common examples of chemical reactions in everyday life, such as baking, batteries, matches burning
3. distinguish between elements (e.g., carbon) and compounds (e.g., carbon dioxide)
4. Basic characteristics of acids and bases, and the pH scale
5. Solubility of common substances (e.g., salt in water, oil in water)

6. Basic concepts of physics
 - a. the effect of forces acting on objects
 - b. motion described in terms of distance traveled, time, speed, and acceleration
 - c. gravity and weight (e.g., force of gravity, difference between mass and weight)
 - d. characteristics of magnets (e.g., magnetic poles, attraction, repulsion)
 - e. attraction and repulsion of electric charges
 - f. electricity (e.g., electric current is the flow of electrons)
 - g. light and sound (e.g., waves, reflection, color, spectrum, pitch, echoes)

Discussion areas

- How is the energy of a rock sitting on the top of a hill different from the energy of a rock sitting at the bottom of the same hill?
- How does the energy associated with a bicycle change as the bicycle speeds up going down a hill?
- By what mechanism is heat transferred from a cup with a hot drink to the hand of a person holding the cup?
- Describe the relative motion of molecules of substances in the solid, liquid, and gas phases.
- How many neutrons are in $^{32}_{15}\text{P}$?
- How are physical changes in a substance different from chemical changes?
- Sometimes when two chemicals are combined, a chemical reaction takes place. What are some of the signs of such a chemical reaction?
- How many H atoms are in calcium hydroxide, $\text{Ca}(\text{OH})_2$?
- What will happen to the pH of an aqueous solution of HCl when a base such as NaOH is added?
- How does mass affect the acceleration of a falling object?
- What will be the effect on two bar magnets if they are positioned such that their north poles are close to each other?
- Why does metal transmit an electric current better than wood does?
- Why does a ripe tomato appear orange when light falls on it?

C. Life Sciences

1. Cell structure and function
 - a. basic cell structures and their function (e.g., nucleus, cell membrane)
 - b. cellular processes, such as cell division and photosynthesis
 - c. common types of biological molecules, such as proteins, fats, and carbohydrates
2. Genetics and evolution
 - a. simple genetics involving dominant and recessive alleles (e.g., relationship between genes and traits)
 - b. common human genetic disorders
 - c. basic structure of DNA and its relationship to genes
 - d. identify processes by which species change over time, including natural selection, mutation, and evolution
3. Diversity of life
 - a. classification systems (e.g., kingdom, genus, species)
 - b. General characteristics of common types of organisms (e.g., amphibians, reptiles, mammals, plants, mushrooms, bacteria)
 - c. basic structure and function of the human body (e.g., the heart and circulatory system, the stomach and digestive system)
4. Ecology
 - a. types and components of ecosystems (e.g., food webs, energy levels, biomes)
 - b. causes of population changes (e.g., naturally occurring diseases, human activity)
 - c. relationships between species such as predator-prey relationships

Discussion areas

- What structures would you expect to find in a typical plant cell but not in an animal cell? What functions do these unique structures carry out for the plant?
- What are some basic differences between photosynthesis and cellular respiration?
- What is the purpose of mitosis and what is the purpose of meiosis? Compare the relative number of chromosomes in a cell that has undergone mitosis with one from the same organism that has undergone meiosis.

- Flower color in pea plants is determined by a single gene with only two alleles. The dominant allele (*W*) produces violet flowers while the recessive allele (*w*) produces white flowers. If a violet-flowered plant (*WW*) is crossed with a white-flowered plant (*ww*), what will be the flowers-color of the pea plants produced?
- What is the relationship between a protein with an abnormal amino acid sequence, as occurs in sickle-cell disease, and the gene for that particular protein?
- The scientific name for a dog is *Canis familiaris*. What level of classification is indicated by the name “*Canis*”?
- What is the fundamental difference, at the cellular level, between a corn plant and a bacterium?
- What organ system distributes nutrients from digested food to cells around the body?
- What are the roles of producers and decomposers in a food web?
- Wolves are predators that prey on deer. How has the deer population responded in areas where wolves have been eradicated?

D. Earth and Space Sciences

1. Physical and historical geology
 - a. Earth’s basic structure (e.g., rocks, crust, mantle, core)
 - b. plate tectonics, volcanoes, and earthquakes
 - c. weathering, erosion, and deposition
 - d. the water cycle
 - e. fossil formation and early history of Earth
2. Earth’s hydrosphere and atmosphere
 - a. basic oceanography, including tides, currents, and ocean floor features
 - b. polar ice caps, icebergs, glaciers
 - c. freshwater (e.g., lakes, rivers, streams, groundwater)
 - d. basic concepts of weather and climate, including the atmosphere, clouds, and precipitation
3. Astronomy
 - a. basic components of the solar system, including the Sun, planets, moons, asteroids, and comets
 - b. phases of the Moon and lunar and solar eclipses
 - c. causes of the seasons
 - d. major features of the universe, including stars, galaxies, and black holes

Discussion areas

- What does the behavior of seismic waves reveal about the structure and physical characteristics of Earth’s interior?
- What are the major agents of erosion?
- How can fossils be useful to a geologist in correlating the north and south walls of the Grand Canyon?
- How does the Moon influence tides?
- How do clouds form?
- Why do lunar and solar eclipses not occur every month?
- Why do the coldest temperatures in the Northern Hemisphere occur during the month of January even though Earth is closer to the Sun in January than it is in July?

E. Science, Technology, and Society

1. The impact of science, technology, and human activity on the environment
 - a. greenhouse gases, air and water pollution, acid rain, and ozone layer depletion
 - b. global climate and sea level change
2. Issues arising in areas such as trash disposal and use of herbicides and insecticides
3. The major issues associated with energy production and the management of natural resources
 - a. identify the benefits of conservation and recycling
 - b. distinguish between renewable and nonrenewable resources
 - c. pros and cons of energy production based on various sources (e.g., fossil, nuclear, water, wind, solar, biomass, geothermal)
 - d. use and extraction of Earth’s resources (e.g., mining, reclamation, deforestation)
4. Applications of science and technology in daily life
 - a. identify some basic chemical properties of household products (e.g., acids and bases such as orange juice and ammonia-based cleaning solvents)
 - b. identify basic physical processes in devices such as batteries, lenses, wireless devices, and communication satellites

- c. recognize the contributions of space technology (e.g., communication and navigation systems)
 - d. identify common agricultural practices (e.g., genetically modified crops, use of herbicides and insecticides, use of antibiotics) and their impact
 - e. use of DNA evidence in forensic investigations
5. The impact of science on public health issues and medical technology
- a. nutrition, medicine, disease, genetic disorders, and health
 - b. identify the purpose of medical technologies such as MRIs and X-rays
 - c. identify the impact of biotechnologies

Discussion areas

- What is the connection between chlorofluorocarbons (CFCs) and the increased risk of skin cancer?
- What is the most likely cause of the increasing rate of global warming? Why is global warming associated with an increase in sea level?
- What are some renewable and some nonrenewable energy sources?
- How do batteries provide electricity?
- How has the use of DNA evidence revolutionized some types of investigations?
- How has the use of antibiotics to treat bacterial infections affected the average human lifespan in the United States?

7. Review Smart Tips for Success

Follow test-taking tips developed by experts

Learn from the experts. Take advantage of the following answers to questions you may have and practical tips to help you navigate the *Praxis* test and make the best use of your time.

Should I guess?

Yes. Your score is based on the number of questions you answer correctly, with no penalty or subtraction for an incorrect answer. When you don't know the answer to a question, try to eliminate any obviously wrong answers and then guess at the correct one. Try to pace yourself so that you have enough time to carefully consider every question.

Can I answer the questions in any order?

You can answer the questions in order or skip questions and come back to them later. If you skip a question, you can also mark it so that you can remember to return and answer it later. Remember that questions left unanswered are treated the same as questions answered incorrectly, so it is to your advantage to answer every question.

Are there trick questions on the test?

No. There are no hidden meanings or trick questions. All of the questions on the test ask about subject matter knowledge in a straightforward manner.

Are there answer patterns on the test?

No. You might have heard this myth: the answers on tests follow patterns. Another myth is that there will never be more than two questions in a row with the correct answer in the same position among the choices. Neither myth is true. Select the answer you think is correct based on your knowledge of the subject.

Can I write on the scratch paper I am given?

Yes. You can work out problems on the scratch paper, make notes to yourself, or write anything at all. Your scratch paper will be destroyed after you are finished with it, so use it in any way that is helpful to you. But make sure to select or enter your answers on the computer.

Smart Tips for Taking the Test

- 1. Skip the questions you find extremely difficult.** Rather than trying to answer these on your first pass through the test, you may want to leave them blank and mark them so that you can return to them later. Pay attention to the time as you answer the rest of the questions on the test, and try to finish with 10 or 15 minutes remaining so that you can go back over the questions you left blank. Even if you don't know the answer the second time you read the questions, see if you can narrow down the possible answers, and then guess. Your score is based on the number of right answers, so it is to your advantage to answer every question.

2. **Keep track of the time.** The on-screen clock will tell you how much time you have left. You will probably have plenty of time to answer all of the questions, but if you find yourself becoming bogged down, you might decide to move on and come back to any unanswered questions later.
3. **Read all of the possible answers before selecting one.** For questions that require you to select more than one answer, or to make another kind of selection, consider the most likely answers given what the question is asking. Then reread the question to be sure the answer(s) you have given really answer the question. Remember, a question that contains a phrase such as “Which of the following does NOT . . .” is asking for the one answer that is NOT a correct statement or conclusion.
4. **Check your answers.** If you have extra time left over at the end of the test, look over each question and make sure that you have answered it as you intended. Many test takers make careless mistakes that they could have corrected if they had checked their answers.
5. **Don’t worry about your score when you are taking the test.** No one is expected to answer all of the questions correctly. Your score on this test is not analogous to your score on the *GRE*[®] or other tests. It doesn’t matter on the *Praxis* tests whether you score very high or barely pass. If you meet the minimum passing scores for your state and you meet the state’s other requirements for obtaining a teaching license, you will receive a license. In other words, what matters is meeting the minimum passing score. You can find passing scores for all states that use the *Praxis* tests at http://www.ets.org/s/praxis/pdf/passing_scores.pdf or on the web site of the state for which you are seeking certification/licensure.
6. **Use your energy to take the test, not to get frustrated by it.** Getting frustrated only increases stress and decreases the likelihood that you will do your best. Highly qualified educators and test development professionals, all with backgrounds in teaching, worked diligently to make the test a fair and valid measure of your knowledge and skills. Your state painstakingly reviewed the test before adopting it as a licensure requirement. The best thing to do is concentrate on answering the questions.

8. Check on Testing Accommodations

See if you qualify for accommodations that may make it easier to take the Praxis test

What if English is not my primary language?

Praxis tests are given only in English. If your primary language is not English (PLNE), you may be eligible for extended testing time. For more details, visit www.ets.org/praxis/register/plne_accommodations/.

What if I have a disability or other health-related need?

The following accommodations are available for *Praxis* test takers who meet the Americans with Disabilities Act (ADA) Amendments Act disability requirements:

- Extended testing time
- Additional rest breaks
- Separate testing room
- Writer/recorder of answers
- Test reader
- Sign language interpreter for spoken directions only
- Perkins Braille
- Braille slate and stylus
- Printed copy of spoken directions
- Oral interpreter
- Audio test
- Braille test
- Large print test book
- Large print answer sheet
- Listening section omitted

For more information on these accommodations, visit www.ets.org/praxis/register/disabilities.

Note: Test takers who have health-related needs requiring them to bring equipment, beverages, or snacks into the testing room or to take extra or extended breaks must request these accommodations by following the procedures described in the *Bulletin Supplement for Test Takers with Disabilities or Health-Related Needs* (PDF), which can be found at http://www.ets.org/s/disabilities/pdf/bulletin_supplement_test_takers_with_disabilities_health_needs.pdf.

You can find additional information on available resources for test takers with disabilities or health-related needs at www.ets.org/disabilities.

9. Do Your Best on Test Day

Get ready for test day so you will be calm and confident

You followed your study plan. You prepared for the test. Now it's time to prepare for test day.

Plan to end your review a day or two before the actual test date so you avoid cramming. Take a dry run to the test center so you're sure of the route, traffic conditions, and parking. Most of all, you want to eliminate any unexpected factors that could distract you from your ultimate goal—passing the *Praxis* test!

On the day of the test, you should:

- be well rested
- wear comfortable clothes and dress in layers
- eat before you take the test
- bring an acceptable and valid photo identification with you
- bring an approved calculator only if one is specifically permitted for the test you are taking (see Calculator Use, at http://www.ets.org/praxis/test_day/policies/calculators)
- be prepared to stand in line to check in or to wait while other test takers check in

You can't control the testing situation, but you can control yourself. Stay calm. The supervisors are well trained and make every effort to provide uniform testing conditions, but don't let it bother you if the test doesn't start exactly on time. You will have the allotted amount of time once it does start.

You can think of preparing for this test as training for an athletic event. Once you've trained, prepared, and rested, give it everything you've got.

What items am I restricted from bringing into the test center?

You cannot bring into the test center personal items such as:

- handbags, knapsacks, or briefcases
- water bottles or canned or bottled beverages
- study materials, books, or notes
- pens, pencils, scrap paper, or calculators, unless specifically permitted for the test you are taking (see Calculator Use, at http://www.ets.org/praxis/test_day/policies/calculators)
- any electronic, photographic, recording, or listening devices

Personal items are not allowed in the testing room and will not be available to you during the test or during breaks. You may also be asked to empty your pockets. At some centers, you will be assigned a space to store your belongings, such as handbags and study materials. Some centers do not have secure storage space available, so please plan accordingly.

Test centers assume no responsibility for your personal items.

If you have health-related needs requiring you to bring equipment, beverages or snacks into the testing room or to take extra or extended breaks, you need to request accommodations in advance. Procedures for requesting accommodations are described in the [Bulletin Supplement for Test Takers with Disabilities or Health-related Needs \(PDF\)](#).

Note: All cell phones, smart phones (e.g., Android® devices, iPhones®, etc.), and other electronic, photographic, recording, or listening devices are strictly prohibited from the test center. If you are seen with such a device, you will be dismissed from the test, your test scores will be canceled, and you will forfeit your test fees. If you are seen *using* such a device, the device will be confiscated and inspected. For more information on what you can bring to the test center, visit www.ets.org/praxis/test_day/bring.

Are You Ready?

Complete this checklist to determine whether you are ready to take your test.

- Do you know the testing requirements for the license or certification you are seeking in the state(s) where you plan to teach?
- Have you followed all of the test registration procedures?
- Do you know the topics that will be covered in each test you plan to take?
- Have you reviewed any textbooks, class notes, and course readings that relate to the topics covered?
- Do you know how long the test will take and the number of questions it contains?
- Have you considered how you will pace your work?
- Are you familiar with the types of questions for your test?
- Are you familiar with the recommended test-taking strategies?
- Have you practiced by working through the practice questions in this study companion or in a study guide or practice test?
- If constructed-response questions are part of your test, do you understand the scoring criteria for these questions?
- If you are repeating a *Praxis* test, have you analyzed your previous score report to determine areas where additional study and test preparation could be useful?

If you answered “yes” to the questions above, your preparation has paid off. Now take the *Praxis* test, do your best, pass it—and begin your teaching career!

10. Understand Your Scores

Understand how tests are scored and how to interpret your test scores

Of course, passing the *Praxis* test is important to you so you need to understand what your scores mean and what your state requirements are.

What are the score requirements for my state?

States, institutions, and associations that require the tests set their own passing scores. Visit www.ets.org/praxis/states for the most up-to-date information.

If I move to another state, will my new state accept my scores?

The *Praxis* tests are part of a national testing program, meaning that they are required in many states for licensure. The advantage of a national program is that if you move to another state that also requires *Praxis* tests, you can transfer your scores. Each state has specific test requirements and passing scores, which you can find at www.ets.org/praxis/states.

How do I know whether I passed the test?

Your score report will include information on passing scores for the states you identified as recipients of your test results. If you test in a state with automatic score reporting, you will also receive passing score information for that state.

A list of states and their passing scores for each test are available online at www.ets.org/praxis/states.

What your *Praxis* scores mean

You received your score report. Now what does it mean? It's important to interpret your score report correctly and to know what to do if you have questions about your scores.

Visit http://www.ets.org/s/praxis/pdf/sample_score_report.pdf to see a sample score report.

To access *Understanding Your Praxis Scores*, a document that provides additional information on how to read your score report, visit www.ets.org/praxis/scores/understand.

Put your scores in perspective

Your score report indicates:

- Your score and whether you passed
- The range of possible scores
- The raw points available in each content category
- The range of the middle 50 percent of scores on the test

If you have taken the same *Praxis* test or other *Praxis* tests in the last 10 years, your score report also lists the highest score you earned on each test taken.

Content category scores and score interpretation

Questions on the *Praxis* tests are categorized by content. To help you in future study or in preparing to retake the test, your score report shows how many raw points you earned in each content category. Compare your “raw points earned” with the maximum points you could have earned (“raw points available”). The greater the difference, the greater the opportunity to improve your score by further study.

Score scale changes

ETS updates *Praxis* tests on a regular basis to ensure they accurately measure the knowledge and skills that are required for licensure. When tests are updated, the meaning of the score scale may change, so requirements may vary between the new and previous versions. All scores for previous, discontinued tests are valid and reportable for 10 years, provided that your state or licensing agency still accepts them.

These resources may also help you interpret your scores:

- *Understanding Your Praxis Scores* (PDF), found at www.ets.org/praxis/scores/understand
- *The Praxis Passing Scores* (PDF), found at www.ets.org/praxis/scores/understand
- State requirements, found at www.ets.org/praxis/states

Appendix: Other Questions You May Have

Here is some supplemental information that can give you a better understanding of the *Praxis* tests.

What do the *Praxis* tests measure?

The *Praxis* tests measure the specific knowledge and skills that beginning teachers need. The tests do not measure an individual's disposition toward teaching or potential for success, nor do they measure your actual teaching ability. The assessments are designed to be comprehensive and inclusive but are limited to what can be covered in a finite number of questions and question types. Teaching requires many complex skills that are typically measured in other ways, including classroom observation, video recordings, and portfolios.

Ranging from Agriculture to World Languages, there are more than 80 *Praxis* tests, which contain selected-response questions or constructed-response questions, or a combination of both.

Who takes the tests and why?

Some colleges and universities use the *Praxis* Core Academic Skills for Educators tests (Reading, Writing, and Mathematics) to evaluate individuals for entry into teacher education programs. The assessments are generally taken early in your college career. Many states also require Core Academic Skills test scores as part of their teacher licensing process.

Individuals entering the teaching profession take the *Praxis* content and pedagogy tests as part of the teacher licensing and certification process required by many states. In addition, some professional associations and organizations require the *Praxis* Subject Assessments for professional licensing.

Do all states require these tests?

The *Praxis* tests are currently required for teacher licensure in approximately 40 states and United States territories. These tests are also used by several professional licensing agencies and by several hundred colleges and universities. Teacher candidates can test in one state and submit their scores in any other state that requires *Praxis* testing for licensure. You can find details at www.ets.org/praxis/states.

What is licensure/certification?

Licensure in any area—medicine, law, architecture, accounting, cosmetology—is an assurance to the public that the person holding the license possesses sufficient knowledge and skills to perform important occupational activities safely and effectively. In the case of teacher licensing, a license tells the public that the individual has met predefined competency standards for beginning teaching practice.

Because a license makes such a serious claim about its holder, licensure tests are usually quite demanding. In some fields, licensure tests have more than one part and last for more than one day. Candidates for licensure in all fields plan intensive study as part of their professional preparation. Some join study groups, others study alone. But preparing to take a licensure test is, in all cases, a professional activity. Because a licensure exam surveys a broad body of knowledge, preparing for a licensure exam takes planning, discipline, and sustained effort.

Why does my state require the *Praxis* tests?

Your state chose the *Praxis* tests because they assess the breadth and depth of content—called the “domain”—that your state wants its teachers to possess before they begin to teach. The level of content knowledge, reflected in the passing score, is based on recommendations of panels of teachers and teacher educators in

each subject area. The state licensing agency and, in some states, the state legislature ratify the passing scores that have been recommended by panels of teachers.

How were the tests developed?

ETS consulted with practicing teachers and teacher educators around the country during every step of the *Praxis* test development process. First, ETS asked them what knowledge and skills a beginning teacher needs to be effective. Their responses were then ranked in order of importance and reviewed by hundreds of teachers.

After the results were analyzed and consensus was reached, guidelines, or specifications, for the selected-response and constructed-response tests were developed by teachers and teacher educators. Following these guidelines, teachers and professional test developers created test questions that met content requirements and [*ETS Standards for Quality and Fairness*](#).*

When your state adopted the research-based *Praxis* tests, local panels of teachers and teacher educators evaluated each question for its relevance to beginning teachers in your state. During this “validity study,” the panel also provided a passing-score recommendation based on how many of the test questions a beginning teacher in your state would be able to answer correctly. Your state’s licensing agency determined the final passing-score requirement.

ETS follows well-established industry procedures and standards designed to ensure that the tests measure what they are intended to measure. When you pass the *Praxis* tests your state requires, you are proving that you have the knowledge and skills you need to begin your teaching career.

How are the tests updated to ensure the content remains current?

Praxis tests are reviewed regularly. During the first phase of review, ETS conducts an analysis of relevant state and association standards and of the current test content. State licensure titles and the results of relevant job analyses are also considered. Revised test questions are then produced following the standard test development methodology. National advisory committees may also be convened to review and revise existing test specifications and to evaluate test forms for alignment with the specifications.

How long will it take to receive my scores?

Scores for tests that do not include constructed-response questions are available on screen immediately after the test. Scores for tests that contain constructed-response questions or essays aren’t available immediately after the test because of the scoring process involved. Official score reports are available to you and your designated score recipients approximately two to three weeks after the test date for tests delivered continuously, or two to three weeks after the testing window closes for other tests. See the test dates and deadlines calendar at www.ets.org/praxis/register/centers_dates for exact score reporting dates.

Can I access my scores on the web?

All test takers can access their test scores via My *Praxis* Account free of charge for one year from the posting date. This online access replaces the mailing of a paper score report.

The process is easy—simply log into My *Praxis* Account at www.ets.org/praxis and click on your score report. If you do not already have a *Praxis* account, you must create one to view your scores.

Note: You must create a *Praxis* account to access your scores, even if you registered by mail or phone.

*[*ETS Standards for Quality and Fairness*](#) (2014, Princeton, N.J.) are consistent with the [*Standards for Educational and Psychological Testing*](#), industry standards issued jointly by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (2014, Washington, D.C.).

Your teaching career is worth preparing for, so start today!
Let the *Praxis*® *Study Companion* guide you.

To search for the *Praxis* test prep resources
that meet your specific needs, visit:

www.ets.org/praxis/testprep

To purchase official test prep made by the creators
of the *Praxis* tests, visit the ETS Store:

www.ets.org/praxis/store

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