Elementary Education: Three Subject Bundle — Mathematics, Social Studies & Science

5901 (subtests 5903, 5904, 5905)
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 41).
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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1. Learn About Your Test

Learn about the specific test you will be taking

Elementary Education: Three Subject Bundle—Mathematics, Social Studies & Science (5901)

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<th>Test Name</th>
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<td>Total Time</td>
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About This Test

The purpose of the test is to assess whether the entry-level elementary teacher has the content knowledge that is important, necessary, and needed at time of entry to the profession to teach mathematics, social studies, and science at the elementary level. The test is designed to support a generalist elementary school license.

This test may contain some questions that will not count toward your score.
Elementary Education: Three Subject Bundle
Mathematics
(5903) Time: 65 minutes; Format: Selected response and numeric entry; on-screen scientific calculator provided

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<td>I. Numbers and Operations</td>
<td>20</td>
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<tr>
<td>II. Algebraic Thinking</td>
<td>15</td>
<td>30%</td>
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<tr>
<td>III. Geometry and Measurement, Data, Statistics, and Probability</td>
<td>15</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
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About This Subtest

The Elementary Education: Three Subject Bundle—Mathematics Subtest is designed for prospective teachers of children in primary through upper elementary school grades. The 50 questions focus on the broad knowledge of mathematics and related competencies necessary to be licensed as a beginning teacher at the elementary school level.

The test is not designed to be aligned with any particular school mathematics curriculum, but it is intended to be consistent with the recommendations of national studies on mathematics education, such as the National Governors Association Center for Best Practices and the Council of Chief State School Officers Common Core State Standards in Mathematics (2010), the National Council of Teachers of Mathematics (NCTM) and the National Council for Accreditation of Teacher Education (NCATE) NCTM NCATE Standards (2012), and the NCTM Principles and Standards for School Mathematics (2000).

The test includes selected-response questions, such as single-selection multiple-choice questions with four choices and multiple selection multiple-choice questions, and numeric entry questions.

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

On-Screen Scientific Calculator

An on-screen scientific calculator is provided for the computer-delivered test. Please consult the Praxis Calculator Use web page for further information.

You are expected to know how and when to use the scientific calculator since it will be helpful for some questions. You are expected to become familiar with its functionality before taking the test. To practice using the calculator, request access to it. The calculator may be used to perform calculations, such as exponents, roots, and percents.

Using Your Calculator

Take time to access the calculator and practice with it so that you are comfortable using the calculator on the test.

There are only some questions on the test for which a calculator is helpful or necessary. First, decide how you will solve a problem, then determine if you need a calculator. For many questions, there is more than one way to solve the problem. Don't use the calculator if you don't need to; you may waste time.
Sometimes answer choices are rounded, so the answer that you get might not match the answer choices in the question. Since the answer choices are rounded, plugging the choices into the question might not produce an exact answer.

Don't round any intermediate calculations. For example, if the calculator produces a result for the first step of a solution, keep the result in the calculator and use it for the second step. If you round the result from the first step and the answer choices are close to each other, you might choose the incorrect answer.

Read the question carefully so that you know what you are being asked to do. Sometimes a result from the calculator is NOT the final answer. If an answer you get is not one of the choices in the question, it may be that you didn't answer the question being asked. Read the question again. It might also be that you rounded at an intermediate step in solving the problem.

Think about how you are going to solve the question before using the calculator. You may only need the calculator in the final step or two. Don't use it more than necessary.

Check the calculator modes (floating decimal versus scientific notation) to see that these are correct for the question being asked.

Make sure that you know how to perform the basic arithmetic operations and calculations (e.g., exponents, roots).

Content Topics

Content topics describe the knowledge and skills measured by the test.

Interspersed throughout the study topics are discussion area questions, 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.

Mathematics Content Topics

I. Numbers and Operations

A. Understands the place value system

1. Writes numbers using base-10 numerals, number names, and expanded form
2. Composes and decomposes multi-digit numbers
3. Given a digit, identifies the place the digit is in and its value in that place
4. Recognizes that a digit in one place represents ten times what it represents in the place to its right and one-tenth what it represents in the place to its left, and extends this recognition to several places to the right or left
5. Uses whole-number exponents to denote powers of 10
6. Rounds multi-digit numbers to any place value

B. Understands operations and properties of rational numbers

1. Solves multistep mathematical and real-world problems using addition, subtraction, multiplication, and division of rational numbers
   a. Identifies different problem situations for the operations (e.g., adding to, taking from, putting together, taking apart, and comparing for subtraction)
   b. Uses the relationship between addition and subtraction and the relationship between multiplication and division to solve problems (e.g., inverse operations)
   c. Interprets remainders in division problems
2. Uses various strategies and algorithms used to perform operations on rational numbers
3. Recognizes concepts of rational numbers and their operations
   a. Identifies examples where multiplication does not result in a product greater than both factors and division does not result in a quotient smaller than the dividend
b. Composes and decomposes fractions, including the use of unit fractions.

c. Recognizes that the value of a unit fraction decreases as the value of the denominator increases.

d. Recognizes that the same whole must be used when comparing fractions.

4. Solves problems using the order of operations, including problems involving whole number exponents.

5. Identifies properties of operations (e.g., commutative, associative, distributive) and uses them to solve problems.

6. Represents rational numbers and their operations in different ways.
   a. Uses, interprets, and explains concrete models or drawings of the addition, subtraction, multiplication, and division of rational numbers.
   b. Represents rational numbers and sums and differences of rational numbers on a number line.
   c. Illustrates and explains multiplication and division problems using equations, rectangular arrays, and area models.

7. Compares, classifies, and orders rational numbers.

8. Converts between fractions, decimals, and percents.

C. Understands proportional relationships and percents
   1. Applies the concepts of ratios and unit rates to describe relationships between two quantities.
   2. Understands percent as a rate per 100.
   4. Uses proportional relationships to solve ratio and percent problems.

D. Knows how to use basic concepts of number theory
   1. Identifies and uses prime and composite numbers.
   2. Finds factors and multiples of numbers.

E. Knows a variety of strategies to determine the reasonableness of results
   1. Recognizes the reasonableness of results within the context of a given problem.
   2. Uses mental math, estimation, and rounding strategies to solve problems and determine reasonableness of results.

Discussion areas: Numbers and Operations

- Why is it that $3$ is greater than $2$, but $\frac{1}{3}$ is less than $\frac{1}{2}$?
- Why do we put an arrow on the end of a number line?
- Is the square of a number always greater than the number? Consider numbers such as $3$, $-2$, $\frac{1}{4}$, and $0$.
- Why is $\frac{0}{1}$ equal to $0$, but $\frac{1}{0}$ is not even defined? Consider using $\frac{20}{5} \times 4$ and relating it to $20 = 5 \times 4$ to explain this difference.
- Create two or three different ways of visually representing the product of $2$ and $4$. Think of objects that elementary students would relate to.
- Are $1$ and $2$ prime numbers? Why or why not?
- Is zero an even number or an odd number?
- Is the sum of two even numbers always even? What about the sum of two odd numbers?
- Make a factor tree for $60$.
- If a movie ticket was $5$ last week and this week is $6$, what was the percent increase?
- If the scale used on a blueprint is $1$ inch to $4$ feet and the drawing of a room is $4.5$ inches wide, how wide is the room?
- Write a problem that uses the “working backwards” method. Be sure to give the end result from which to work.

II. Algebraic Thinking

A. Knows how to evaluate and manipulate algebraic expressions, equations, and formulas
   1. Differentiates between algebraic expressions and equations.
   2. Adds and subtracts linear algebraic expressions.
   3. Uses the distributive property to generate equivalent linear algebraic expressions.
   4. Evaluates simple algebraic expressions (i.e., one variable, binomial) for given values of variables.
5. Uses mathematical terms to identify parts of expressions and describe expressions
6. Translates between verbal statements and algebraic expressions or equations (e.g., the phrase “the number of cookies Joe has is equal to twice the number of cookies Sue has” can be represented by the equation $j = 2s$)
7. Uses formulas to determine unknown quantities
8. Differentiates between dependent and independent variables in formulas

B. Understands the meanings of the solutions to linear equations and inequalities
1. Solves multistep one-variable linear equations and inequalities
2. Interprets solutions of multistep one-variable linear equations and inequalities (e.g., graphs the solution on a number line, states constraints on a situation)
3. Uses linear relationships represented by equations, tables, and graphs to solve problems

C. Knows how to recognize and represent patterns (e.g., number, shape)
1. Identifies, extends, describes, or generates number and shape patterns
2. Makes conjectures, predictions, or generalizations based on patterns
3. Identifies relationships between the corresponding terms of two numerical patterns (e.g., find a rule for a function table)

Discussion areas: Algebraic Thinking
- How would you translate the following statement into a mathematical expression that includes variables?
  “The number of red chips is 3 more than the number of blue chips.”
- In the previous example, if there are 41 blue chips and red chips altogether, how many are red?
- What is the difference between an expression and an equation?
- How can the solution to $-3 \leq x < 10$ be represented visually?

III. Geometry and Measurement, Data, Statistics, and Probability

A. Understands how to classify one-, two-, and three-dimensional figures
1. Uses definitions to identify lines, rays, line segments, parallel lines, and perpendicular lines
2. Classifies angles based on their measure
3. Composes and decomposes two- and three-dimensional shapes
4. Uses attributes to classify or draw polygons and solids

B. Knows how to solve problems involving perimeter, area, surface area, and volume
1. Represents three-dimensional figures with nets
2. Uses nets that are made of rectangles and triangles to determine the surface area of three-dimensional figures
3. Finds the area and perimeter of polygons, including those with fractional side lengths
4. Finds the volume and surface area of right rectangular prisms, including those with fractional edge lengths
5. Determines how changes to dimensions change area and volume

C. Knows the components of the coordinate plane and how to graph ordered pairs on the plane
1. Identifies the $x$-axis, the $y$-axis, the origin, and the four quadrants in the coordinate plane
2. Solves problems by plotting points and drawing polygons in the coordinate plane

D. Knows how to solve problems involving measurement
1. Solves problems involving elapsed time, money, length, volume, and mass
2. Measures and compares lengths of objects using standard tools
3. Knows relative sizes of United States customary units and metric units
4. Converts units within both the United States customary system and the metric system

E. Is familiar with basic statistical concepts
1. Identifies statistical questions
2. Solves problems involving measures of center (mean, median, mode) and range
3. Recognizes which measure of center best describes a set of data
4. Determines how changes in data affect measures of center or range
5. Describes a set of data (e.g., overall patterns, outliers)

F. Knows how to represent and interpret data presented in various forms
   1. Interprets various displays of data (e.g., box plots, histograms, scatterplots)
   2. Identifies, constructs, and completes graphs that correctly represent given data (e.g., circle graphs, bar graphs, line graphs, histograms, scatterplots, double bar graphs, double line graphs, box plots, and line plots/dot plots)
   3. Chooses appropriate graphs to display data

G. Is familiar with how to interpret the probability of events
   1. Interprets probabilities relative to likelihood of occurrence

Discussion areas: Geometry and Measurement, Data, Statistics, and Probability
   • Do rectangles that have the same perimeter always have the same area?
   • For a given perimeter, what is the shape with the greatest area?
   • If a figure is a rectangle, is it also a square?
   • If a figure is a square, is it also a rectangle?
   • What is the area of the following shape?

   - What stays the same when a transformation is applied?
   - What changes when a transformation is applied?

   • Describe the transformation shown below
     What stays the same and what changes?

     \[ y \]
     \[ x \]

   • On a number line, draw arrows to model this calculation: \( 13 - 8 + 4 - 2 \)
   • On a grid, model 24 as a product of integers in four different ways.
   • On a grid, model 24 as the product of mixed numbers or decimals.
   • On a grid, model 24 as the product of numbers that contain square roots.
   • What natural phenomena are the bases for many of our time measurements?
   • Is 60 kilograms a reasonable weight for a 6-year-old child? Explain by using a benchmark for a kilogram (i.e., an easy-to-manipulate translation to pounds)
   • Can a circle graph and a line graph display the same information? Why or why not?
   • How is a stem-and-leaf plot like a bar graph? How is it different?
   • Describe a real-life use of a mode.
   • Describe a real-life situation that illustrates a direct relationship.
   • Describe a real-life situation that illustrates an inverse relationship.
   • What are the volumes of the following shapes?

     • Figure not drawn to scale.

Note: Figures not drawn to scale.
• Draw a trapezoid that can be subdivided into four congruent right triangles.
• Draw a trapezoid that can be subdivided into three equilateral triangles.
• Can a right triangle be isosceles?
• Make a sample space for the possible outcomes of the toss of three fair coins and explain why the computation $2 \times 2 \times 2$ gives the number of outcomes in the sample space.
• Tree diagrams: illustrating all ways for an event to happen
• Combinations: counting when order does not matter
• Permutations: counting when order does matter
• Is the average of two different numbers ever greater than one of them?
• Can I find the average of 10 numbers if I know the sum of them but not the numbers themselves?
• Can I find the median of 10 numbers if I know the sum of them but not the numbers themselves?
Step 1: Learn About Your Test

Elementary Education: Three Subject Bundle
Social Studies
(5904) Time: 60 minutes; Format: Selected response

Social Studies Categories

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<td>II. Geography, Anthropology, and Sociology</td>
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<td>III. World History and Economics</td>
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About This Subtest

The Elementary Education: Three Subject Bundle—Social Studies subtest is designed to assess whether an examinee has the broad knowledge and competencies necessary to be licensed as a beginning teacher at the elementary school level. The 60 selected-response questions are based on the material typically covered in a bachelor’s degree program in elementary education.

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

Social Studies Content Topics

I. United States History, Government, and Citizenship

A. Knows European exploration and colonization in United States history and growth and expansion of the United States
B. Knows about the American Revolution and the founding of the nation in United States history
C. Knows the major events and developments in United States history from founding to present (e.g., westward expansion, industrialization, Great Depression)
D. Knows about twentieth-century developments and transformations in the United States (e.g., assembly line, space age)
E. Understands connections between causes and effects of events
F. Understands the nature, purpose, and forms (e.g., federal, state, local) of government
G. Knows key documents and speeches in the history of the United States (e.g., United States Constitution, Declaration of Independence, Gettysburg Address)
H. Knows the rights and responsibilities of citizenship in a democracy
Step 1: Learn About Your Test

**Discussion areas: United States History**
- What were the weaknesses in the Articles of Confederation that eventually led to its replacement by the Constitution? Why were the Articles written in this way in the first place?
- Name some ways the Constitution affects our lives today.
- What was the Supreme Court’s decision in *Marbury v. Madison* and what did it establish?
- What was “Manifest Destiny” and how did it influence the expansion of United States territory?
- Make your own “immigration timeline” of the nineteenth century, noting the decades during which immigrants from various countries or regions came to the United States in large numbers.
- Post-Civil War immigration can be viewed in terms of the “melting pot” analogy or in terms of “pluralism” or “multiculturalism.” What does this distinction mean, and why is it important?
- What was the Supreme Court’s decision in *Brown v. Board of Education of Topeka*?
- How was the later decision in *University of California v. Bakke* related to another important educational issue in the twentieth century?

**Discussion areas: Government and Citizenship**
- Compare the major features of a democratic government with those of other forms of government.
- Why were the Mayflower Compact, the Declaration of Independence, and Magna Carta such milestone documents in the political history of the world?
- What is the purpose of the system of checks and balances the United States government?
- What are some examples of checks and balances?
- How has the United States Constitution impacted the relationship between the federal government and the states (e.g., the 10th Amendment, the Commerce Clause)?

**II. Geography, Anthropology, and Sociology**

**A.** Knows world and regional geography (e.g., spatial terms, places, regions)

**B.** Understands the interaction of physical and human systems (e.g., how humans change the environment, how the environment changes humans, importance of natural and human resources)

**C.** Knows the uses of geography (e.g., apply geography to interpret past, to interpret present, to plan for future)

**D.** Knows how people of different cultural backgrounds interact with their environment, family, neighborhoods, and communities

**Discussion areas: Geography**
- What is "map projection" and what kinds of decisions does it force mapmakers to make?
- What is the primary categorization of each of these regions, and why? Arab world, North Africa, Sub-Saharan Africa, Latin America, the Caribbean, North America, Western Europe, Eastern Europe, East Asia, South Central Asia, Southeast Asia, and Oceania
- What is the difference between weather and climate?
- How do earthquakes create mountain ranges?
- What kinds of physical systems led to the creation of the Grand Canyon? What about Yosemite Valley?

**III. World History and Economics**

**A.** Knows the major contributions of classical civilizations (e.g., Egypt, Greece, Rome)

**B.** Understands twentieth-century developments and transformations in world history

**C.** Understands the role of cross-cultural comparisons in world history instruction

**D.** Knows key terms and basic concepts of economics (e.g., supply and demand, scarcity and choice, money and resources)

**E.** Understands how economics affects population, resources, and technology

**F.** Understands the government’s role in economics and the impact of economics on government
Discussion areas: World History

- List as many ways as you can that the pyramids and burial customs of Egypt reflected aspects of Egyptian political, social, cultural, religious, bureaucratic (record keeping and writing), and artistic systems, elements, and values.
- How were the concepts of citizenship and democracy in ancient Greece similar and different from contemporary United States concepts of citizenship and democracy?
- How does a comparison of life in Athens and Sparta illuminate differences among nations in the world today?
- List Greece's important contributions (in drama, sculpture, sports, architecture, mathematics, and science) and the emphasis on human achievement
- How big did the Roman Empire get, with what borders, at its largest? In comparison, how small was it when it fell? What were the main reasons for the success at its largest point and its gradual shrinking?
- What are the main reasons that a global culture emerged in the twentieth century? What are the consequences of this global culture?

Discussion areas: Economics

- Why is it claimed that the concept of "scarcity" is the basis for the discipline of economics?
Step 1: Learn About Your Test

Elementary Education: Three Subject Bundle Science
(5905) Time: 60 minutes; Format: Selected response; on-screen scientific calculator provided

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<td>II. Life Science</td>
<td>18–19</td>
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<td>III. Physical Science</td>
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About This Subtest
The Elementary Education: Three Subject Bundle—Science subtest is designed to assess whether an examinee has the broad knowledge and competencies necessary to be licensed as a beginning teacher at the elementary school level. The 55 selected-response questions are based on the material typically covered in a bachelor’s degree program in elementary education. The development of the test questions and the construction of the test reflect the National Science Education Standards (NSES) and the National Science Teaching Association (NSTA) standards.

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On-Screen Scientific Calculator
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For many questions, there is more than one way to solve the problem. Don’t use the calculator if you don’t need to; you may waste time.

Science Content Topics

I. Earth Science
A. Understands the structure of the Earth system (e.g., structure and properties of the solid Earth, the hydrosphere, the atmosphere)
B. Understands processes of the Earth system (e.g., processes of the solid Earth, the hydrosphere, the atmosphere)
C. Understands Earth history (e.g., origin of Earth, paleontology, the rock record)
D. Understands Earth and the universe (e.g., stars and galaxies; the solar system and planets; Earth, Sun, and Moon relationships)
E. Understands Earth patterns, cycles, and change
F. Understands science as a human endeavor, a process, and a career
G. Understands science as inquiry (e.g., questioning, gathering data, drawing reasonable conclusions)
H. Understands how to use resource and research material in science
I. Understands the unifying processes of science (e.g., systems, order, organization)

Discussion areas: Earth Science

• What is the inside of Earth like?
• What is the difference between rocks and minerals?
• What substances are found in concrete?
• What are fossils and how are they formed?
• In which layer of the atmosphere is the aurora borealis displayed? What is the cause of this natural light show?
• What is air pressure and how is it measured?
• Why do monuments in Egypt last for thousands of years, while similar monuments in northern climates deteriorate very quickly?
• What is the “Ring of Fire”?
• What causes a volcano to erupt?
• What causes earthquakes?
• What causes tides? What do “low tide” and “high tide” mean?
• The greatest difference in water level between a low tide and a high tide occurs because of what alignment of the Moon, Sun, and Earth?
• How do storms form? How do oceans affect climate?
• Why do the planets circle the Sun?
• How does a solar eclipse occur?
• How are the inner planets of the solar system different from the outer planets?
• What causes the seasons on Earth? What is the positional relationship of the Sun and Earth at each season?
• Why do the stars appear to move across the sky each night while the pattern of stars stays the same?
• Why do different stars appear during different seasons?
• Why does the position of a planet as seen from Earth change in relation to the background of stars?
• Why do stars twinkle while planets do not?

E. Understands unity and diversity of life, adaptation, and classification
F. Understands the interdependence of organisms (e.g., ecosystems, populations, communities)
G. Knows about personal health (e.g., nutrition, communicable diseases, substance abuse)
H. Understands science as a human endeavor, a process, and a career
I. Understands science as inquiry (e.g., questioning, gathering data, drawing reasonable conclusions)
J. Understands how to use resource and research material in science
K. Understands the unifying processes of science (e.g., systems, order, organization)

Discussion areas: Life Science

• Are most cells flat? What do electron microscope pictures show us about cell shape?
• Why are roots, stems, and leaves important to plants?
• How does the human circulatory system work?
• How does the human digestive system work?
• What are dominant and recessive traits?
• How can two parents with brown eyes have a child with blue eyes?
• What are the steps in complete metamorphosis? Incomplete metamorphosis?
• What is meant by “survival of the fittest”?
• What makes a plant bend toward the light?
• What is the scientific term associated with this?
• How does the human body maintain a constant temperature?
• What are adaptations?
• What happens if certain kinds of organisms, such as edible plants, are introduced or removed from a food chain?
• How do food chains become food webs?
Step 1: Learn About Your Test

III. Physical Science

A. Understands the physical and chemical properties and structure of matter (e.g., changes of states, mixtures and solutions, atoms and elements)

B. Understands forces and motions (e.g., types of motion, laws of motion, forces and equilibrium)

C. Understands energy (e.g., forms of energy, transfer and conservation of energy, simple machines)

D. Understands interactions of energy and matter (e.g., electricity, magnetism, sound)

E. Understands science as a human endeavor, a process, and a career

F. Understands science as inquiry (e.g., questioning, gathering data, drawing reasonable conclusions)

G. Understands how to use resource and research material in science

H. Understands the unifying processes of science (e.g., systems, order, organization)

Discussion areas: Physical Science

• Does air take up space?
• Sometimes when two chemicals are combined, a chemical reaction takes place.
• What are some of the signs of such a chemical reaction?
• What is an example of a change of state?
• Where are the protons located in an atom?
• How long does it take for a car traveling 30 miles per hour to go 3 miles?
• When a person is driving a car that is moving at the same speed as another car next to it, why does the second car appear to be still?
• What causes an object in motion to accelerate or slow down?
• What is the difference between weight and mass?
• Describe various ways in which an object can have several forces acting on it and still be at rest.
• How do visible light waves differ from sound waves and water waves?
• What is an example of how each of the nonvisible waves is used in day-to-day life?
• What about the properties of light makes a red apple appear red?

• Is light that interacts with a mirror reflected or refracted?
• Which types of lenses magnify and which types produce an image reduced in size?
• How do lenses help nearsighted and farsighted people?
• What are the basic components of a simple electric circuit?
• How does a compass work?
• Some appliances can convert electrical energy to heat energy, light energy, and energy of motion. Give an example of each.
• Why does the sound that accompanies a lightning strike come after the flash of light?
• What are echoes, and what causes them?
• 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?
• Why does rubbing your hands together make them warmer?
• Describe how energy is transformed from potential energy to kinetic energy as a bicycle travels downhill.
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](https://www.praxiscore.com) 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.
3. Practice with Sample Test Questions

*Answer practice questions and find explanations for correct answers*

**Computer-Delivered Test**

This test is available via computer delivery. To illustrate what the computer-delivered test looks like, the following sample question shows an actual screen used in a computer-delivered test. For the purposes of this guide, sample questions are provided as they would appear in a paper-delivered test.

What quantity of oxygen, O₂, contains very nearly the same number of molecules as 36.0 grams of water, H₂O?

- 64.0 grams
- 32.0 grams
- 16.0 grams
- 8.0 grams

Answer the question above by clicking on the correct response.
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.

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

1. Which of the following is an example of the commutative property of addition?
   (A) $5 \times 3 = 3 \times 5$
   (B) $(1+7) + 4 = 1 + (7 + 4)$
   (C) $6 \times (4 + 2) = (6 \times 4) + (6 \times 2)$
   (D) $8 + 9 = 9 + 8$

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>-20</td>
</tr>
<tr>
<td>7</td>
<td>-38</td>
</tr>
<tr>
<td>12</td>
<td>-68</td>
</tr>
<tr>
<td>15</td>
<td>-86</td>
</tr>
</tbody>
</table>

2. Which of the following equations gives the rule for the table shown?
   (A) $y = -8x + 4$
   (B) $y = -7x + 4$
   (C) $y = -6x + 4$
   (D) $y = -5x + 4$

3. A fourth-grade class started working on math worksheets at 1:30 P.M. and stopped working at 3:10 P.M. How long did the class work on the math worksheets?
   (A) 40 minutes
   (B) 80 minutes
   (C) 100 minutes
   (D) 120 minutes

4. A student plans to simultaneously toss a fair number cube, with faces numbered 1 through 6, and a fair coin. What is the probability that the cube will land with the face numbered 4 up and the coin will land heads up?
   (A) $\frac{1}{12}$
   (B) $\frac{1}{8}$
   (C) $\frac{1}{6}$
   (D) $\frac{2}{3}$

5. The only prime factors of a certain number are 2, 3, and 7. Which of the following could be the number?
   (A) $18 \times 28$
   (B) $20 \times 21$
   (C) $22 \times 63$
   (D) $24 \times 35$

6. Which of the following is equivalent to the inequality above?
   (A) $p \leq 2$
   (B) $p \geq 2$
   (C) $p \leq -2$
   (D) $p \geq -2$

7. Which of the following best describes the polygon above?
   (A) A regular hexagon
   (B) An arrow
   (C) A convex hexagon
   (D) A concave hexagon
8. After a lesson on rounding and estimation, a teacher tells students that 157 rulers will be distributed to 4 teachers. The teacher asks the students to estimate the number of rulers each teacher will receive if the rulers are shared as equally as possible among the teachers. Which of the following students produces the best estimate for the number of rulers each teacher will receive?

(A) Student A: about 30
(B) Student B: about 35
(C) Student C: about 40
(D) Student D: about 45

9. Jack had three babysitting jobs this week. He worked the same number of hours $H$ on each job. He was paid at a rate of $12 for every hour at his first job, $4 for every half hour at his second job, and $5 for every 20 minutes at his third job. Which of the following expressions could be used to find the total amount, in dollars, Jack earned?

(A) $12 \times H + 4 \times H + 5 \times H$
(B) $12 \times H + 8 \times H + 15 \times H$
(C) $12 \times H + 8 \times H + 20 \times H$
(D) $12 \times H + 4 \times \frac{1}{2} \times H + 5 \times \frac{1}{3} \times H$

10. To make fruit punch, Edie mixes two kinds of juices in the following ratio: 1 cup of blueberry to 3 cups of red raspberry. How many cups of red raspberry will Edie need to make 48 cups of fruit punch?

(A) 12
(B) 16
(C) 24
(D) 36

11. Riding on a school bus are 20 students in ninth grade, 10 students in tenth grade, 9 students in eleventh grade, and 7 students in twelfth grade. Approximately what percent of the students on the bus are in ninth grade?

(A) 23%
(B) 43%
(C) 46%
(D) 76%

12. In the expression $4x^2 + 7$, what is the degree of $4x^2$?

(A) 0
(B) 1
(C) 2
(D) 4

13. What is the area, in square units, of the figure above?

(A) 32
(B) 52
(C) 64
(D) 104
The correct answer is (D). The question requires an understanding of the properties of operations. A binary operation \( (S, \Delta) \) is commutative if for any pair \( (a, b) \), where \( a \) and \( b \) are in \( S \), \( a \Delta b = b \Delta a \). In this case \( S \) is the set of real numbers and \( \Delta \) is +.

2. The correct answer is (C). The question requires an understanding of how to identify relationships between the corresponding terms of two numerical patterns. The slope of the equation can be found by calculating the rate of change for any two pairs \((x, y)\), e.g., \( \frac{-38 - (-20)}{7 - 4} = -6 \).

3. The correct answer is (C). The question requires an understanding of how to solve problems involving the measurement of elapsed time. Between 1:30 P.M. and 3:10 P.M. there are 1 hour and 40 minutes, or 100 minutes.

4. The correct answer is (A). The question requires an understanding of how to interpret probabilities relative to likelihood of occurrence. The coin has 2 possible outcomes: heads or tails. The probability of the coin landing heads up is 1 out of 2, or \( \frac{1}{2} \). The cube has 6 possible outcomes: 1, 2, 3, 4, 5, or 6. The probability of the face numbered 4 landing up is 1 out of 6, or \( \frac{1}{6} \). To find the combined probability, multiply the two independent probabilities together, i.e., \( 12 \times 16 = \frac{1}{12} \).

5. The correct answer is (A). The question requires an understanding of how to find factors and multiples of numbers. The prime factorization of 18 is \( 2 \times 3^2 \) and the prime factorization of 28 is \( 2^2 \times 7 \). So the prime factorization of 18 \( \times 28 \) is \( 2^3 \times 3 \times 7 \).

6. The correct answer is (A). The question requires an understanding of how to solve multistep one-variable linear inequalities. The addition property of inequalities states that for any real numbers \( a \), \( b \), and \( c \), if \( a \leq b \), then \( a + c \leq b + c \) and if \( a \geq b \), then \( a + c \geq b + c \). Adding -5 to both sides of the inequality yields the equivalent inequality \( 0 \leq 2 - p \). Adding \( p \) to both sides of the new inequality yields the equivalent inequality \( p \leq 2 \).

7. The correct answer is (D). The question requires an understanding of how to use attributes to classify or draw polygons. A polygon with six sides is called a hexagon. A concave polygon is a simple polygon, i.e., one whose sides do not intersect, with at least one interior angle greater than 180 degrees. A concave polygon has at least one diagonal with points outside the polygon.

8. The correct answer is (C). The question requires an understanding of how to use rounding strategies to solve problems and determine the reasonableness of results. To estimate the number of rulers each teacher will receive, one needs to estimate 157 + 4. The best estimate is produced by rounding 157 to the closest number that is easily divided by 4 in a mental calculation. Rounding 157 up to 160 yields the easy mental calculation \( 160 \div 4 \), producing an estimate of 40.

9. The correct answer is (B). The question requires an understanding of how to translate between verbal statements and algebraic expressions or equations. Jack made 12 dollars per hour at his first job. He made 4 dollars per half hour, or \( 4 \times 2 = 8 \) dollars per hour, at his second job. Finally, Jack made 5 dollars for each 20 minutes, or \( 5 \times 3 = 15 \) dollars per hour, at his third job. If he worked \( H \) hours at each job, he made \( 12H + 8H + 15H \).

10. The correct answer is (D). The question requires an understanding of how to use proportional relationships to solve ratio problems. With 1 cup of blueberry juice and 3 cups of red raspberry juice, Edie can make 4 cups of punch. Since \( 48 \div 4 = 12 \), to make 48 cups of punch, Edie will need 12 cups of blueberry juice and 36 cups of red raspberry juice.

11. The correct answer is (B). The question requires an understanding of percent as a rate per 100. Percent refers to how many out of one hundred or, in decimal form, how many hundredths. To find a percent, divide the group \((20)\) by the total \((46)\) and round the decimal to the hundredths place \((0.43)\). This is 43 hundredths or \( \frac{43}{100} \) or 43\%.

12. The correct answer is (C). The question requires an understanding of how to use mathematical terms to identify parts of expressions and describe expressions. The degree of a monomial is the sum of the exponents of the variables that appear in it. In \( 4x^2 \) there is only one variable, \( x \), and its exponent is 2.

13. The correct answer is (B). The question requires an understanding of how to find the area of polygons, including those with fractional side lengths. The figure is composed of a rectangle and a triangle. The rectangle has length 10 and width 4, so its area is 40. The triangle can be thought of as having a base of 4 and a height of 6. Its area is \( \frac{1}{2} \times 4 \times 6 \), or 12. The combined area is, therefore, 40 + 12, or 52.
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.

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

1. Which of the following mountain ranges crosses through the state of Washington?
   (A) The Cascades
   (B) The Himalayas
   (C) The Appalachians
   (D) The Alps

2. Which of the following types of maps shows the boundaries of countries, states or municipalities?
   (A) Thematic
   (B) Topographic
   (C) Political
   (D) Meteorological

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

4. Since the end of the United States Civil War in 1865, all of the following have been successful efforts of groups seeking civil rights for African Americans EXCEPT
   (A) passage of affirmative action legislation
   (B) desegregation of public educational facilities
   (C) creation of a major national political party
   (D) establishing antilynching campaigns

5. The legal doctrine known as “separate but equal” was overturned by the Supreme Court’s ruling in which of the following cases?
   (A) Plessy v. Ferguson
   (B) Brown v. Board of Education of Topeka
   (C) Miranda v. Arizona
   (D) Mapp v. Ohio

6. In the United States, the division of power between the national and state governments demonstrates the principle of
   (A) checks and balances
   (B) federalism
   (C) separation of powers
   (D) the rule of law

7. What percent of the seats in the United States House of Representatives are up for election every two years?
   (A) 33%
   (B) 50%
   (C) 66%
   (D) 100%

8. Historically, India’s society has been organized into hierarchical groups known as
   (A) tribes
   (B) castes
   (C) clans
   (D) denominations
9. Which of the following major world religions is monotheistic?
   (A) Taoism  
   (B) Buddhism  
   (C) Islam  
   (D) Shintoism

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

11. Jane is saving to buy a new car. Her friends are planning a weekend trip to the beach. She wants to go, but decides that saving for the car is more important. Jane’s choice best demonstrates which of the following economic concepts?
   (A) Opportunity cost  
   (B) Supply and demand  
   (C) Scarcity of resources  
   (D) Comparative advantage
Social Studies Answers

1. The correct answer is (A). The Cascade Mountains cross through the state of Washington.

2. 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.

3. The correct answer is (C). During the Ice Age, the level of the water in the Pacific Ocean lowered, thereby exposing a land bridge across the Bering Strait. The cold northern climate encouraged many people to migrate to North America in search of better living conditions.

4. The correct answer is (C). Both the Republican and Democratic political parties were established prior to the Civil War and groups that have tried to create a third major political party have not been successful.

5. The correct answer is (B). In Brown v. Board of Education of Topeka, the Supreme Court ruled that segregating schools on the basis of race was inherently discriminatory. This decision overturned the precedent set by Plessy v. Ferguson, which ruled that “separate but equal” did not infringe upon the 14th Amendment.

6. The correct answer is (B), federalism. Federalism is the division of power between a central government and constituent governments, called states in the United States. Checks and balances refers to the constitutional arrangement of powers that prevents one branch of the government from becoming too powerful. Separation of powers refers to the division of power among the three branches of the United States government. The rule of law is the principle which holds that no person is above the law.

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

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

9. 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.

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

11. The correct answer is (A). Opportunity cost is the value of what is forgone when an economic choice is made. In this example, the opportunity cost of saving for the car is forgoing a weekend trip with friends.
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.

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

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

2. When the Moon is viewed from the Northern Hemisphere at the first quarter of the lunar cycle, it appears like which of the diagrams above
   (A) 1
   (B) 2
   (C) 3
   (D) 4

3. Which THREE of the following are ways in which mammals keep themselves warm in cold weather?
   (A) Shivering
   (B) Perspiring
   (C) Fluffing out coat hair
   (D) Contracting certain blood vessels

4. If a feather and two rocks of different weights were dropped simultaneously from a height of 5 meters in a vacuum, which of the following would be true?
   (A) Both rocks would hit the ground at the same time, but before the feather.
   (B) The heavier rock would hit the ground first.
   (C) The lighter rock would hit the ground first.
   (D) The feather and the two rocks would all hit the ground at the same time.

5. Which of the following laboratory instruments would be most appropriate to use in determining the volume of a large block of wood of unknown density?
   (A) A metric ruler
   (B) A triple-beam balance
   (C) A 200 mL volumetric flask
   (D) A micrometer

6. A scientific hypothesis is a statement that
   (A) ensures an experiment will produce positive results
   (B) is accepted by most of the scientific community
   (C) is a proposal that may lead to experimental testing
   (D) is formulated by a renowned scientist

7. Which of the following is the broadest category in the biological taxonomy?
   (A) Kingdom
   (B) Order
   (C) Genus
   (D) Species
8. 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

9. 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

10. Two campers each wrap a potato in aluminum foil prior to baking them in fire. However, one camper inserts a large nail into her potato after wrapping it in the foil. After the potatoes are placed in the fire, which of the following is most likely to happen?
    (A) Both potatoes will bake at the same rate.
    (B) Neither potato will bake because the foil will reflect most of the heat.
    (C) The potato with the imbedded nail will bake faster because heat will be conducted through the nail into the potato.
    (D) The potato with the imbedded nail will bake more slowly because heat will be conducted out of the potato through the nail.

11. Alfred Wegener proposed which of the following in the early 1900s?
    (A) The Sun, not Earth, is the center of the universe.
    (B) Earth once contained a single supercontinent.
    (C) An ocean current called the Gulf Stream flows northward along the east coast of the United States and Newfoundland.
    (D) The Himalayas were formed by plate tectonics.

12. Which of the following is a chemical element?
    (A) Sodium chloride
    (B) Platinum
    (C) Carbon dioxide
    (D) Water

13. Of the following, which best describes an example of the Doppler effect?
    (A) As light passes through a prism, the light separates into a rainbow.
    (B) As a light beam passes from air into water, the beam changes direction.
    (C) As an emergency vehicle approaches an observer standing by the road, the pitch of its siren increases.
    (D) As a sound wave hits a wall, it is reflected and creates an echo.
Science Answers

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

2. The correct answer is (B). At the first lunar quarter, the Sun, Earth, and Moon form a right triangle, with Earth at the right angle, so that the half of the Moon facing Earth appears both half-illuminated and half-dark. When viewed from the Northern Hemisphere, the right half will appear illuminated.

3. The correct answers are (A), (C), and (D). Shivering produces heat. Fluffing out coat hair provides insulation and helps to retain body heat. Contracting certain blood vessels reduces blood flow to extremities and thus reduces heat loss. However, perspiring does not help because the skin is cooled as energy is absorbed by the sweat as it evaporates.

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

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

6. The correct answer is (C). A hypothesis is a proposed explanation of a scientific problem. After the hypothesis is proposed, scientific experimentation may be conducted that produces data that can either support or fail to support the hypothesis.

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

8. 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.

9. 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.

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

11. The correct answer is (B). In the early 1900s, Alfred Wegener proposed a theory that Earth once contained a single large landmass called Pangaea.

12. The correct answer is (B). Platinum is a chemical element found on the periodic table of elements. Its chemical symbol is Pt. Sodium chloride, carbon dioxide, and water are compounds that are each composed of combinations of two different elements.

13. The correct answer is (C). According to the Doppler effect, as the source of a sound moves toward an observer at a fixed position, the successive sound waves arrive faster and faster at the observer’s position, resulting in an increase in the frequency of the sound waves arriving at the observer’s position. Since the pitch of a sound is proportional to the frequency, the perceived pitch of the sound increases as the vehicle approaches the observer.
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 17, 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/dates_centers.
- 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 44.

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 37 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 37 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 48.

- **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.

<table>
<thead>
<tr>
<th>Praxis Test Name (Test Code):</th>
<th>Core Academic Skills for Educators: Reading (5712)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Date:</td>
<td>9/15/19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content covered</th>
<th>Description of content</th>
<th>How well do I know the content? (scale 1–5)</th>
<th>What resources do I have/need for the content?</th>
<th>Where can I find the resources I need?</th>
<th>Dates I will study the content</th>
<th>Date completed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Ideas and Details</strong></td>
<td></td>
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</tr>
<tr>
<td>Close reading</td>
<td>Draw inferences and implications from the directly stated content of a reading selection</td>
<td>3</td>
<td>Middle school English textbook</td>
<td>College library, middle school teacher</td>
<td>7/15/19</td>
<td>7/15/19</td>
</tr>
<tr>
<td>Determining Ideas</td>
<td>Identify summaries or paraphrases of the main idea or primary purpose of a reading selection</td>
<td>3</td>
<td>Middle school English textbook</td>
<td>College library, middle school teacher</td>
<td>7/17/19</td>
<td>7/17/19</td>
</tr>
<tr>
<td>Determining Ideas</td>
<td>Identify summaries or paraphrases of the supporting ideas and specific details in a reading selection</td>
<td>3</td>
<td>Middle and high school English textbook</td>
<td>College library, middle and high school teachers</td>
<td>7/20/19</td>
<td>7/21/19</td>
</tr>
<tr>
<td><strong>Craft, Structure, and Language Skills</strong></td>
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<tr>
<td>Interpreting tone</td>
<td>Determine the author’s attitude toward material discussed in a reading selection</td>
<td>4</td>
<td>Middle and high school English textbook</td>
<td>College library, middle and high school teachers</td>
<td>7/25/19</td>
<td>7/26/19</td>
</tr>
<tr>
<td>Analysis of structure</td>
<td>Identify key transition words and phrases in a reading selection and how they are used</td>
<td>3</td>
<td>Middle and high school English textbook, dictionary</td>
<td>College library, middle and high school teachers</td>
<td>7/25/19</td>
<td>7/27/19</td>
</tr>
<tr>
<td>Analysis of structure</td>
<td>Identify how a reading selection is organized in terms of cause/effect, compare/contrast, problem/solution, etc.</td>
<td>5</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/1/19</td>
<td>8/1/19</td>
</tr>
<tr>
<td>Author’s purpose</td>
<td>Determine the role that an idea, reference, or piece of information plays in an author’s discussion or argument</td>
<td>5</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/1/19</td>
<td>8/1/19</td>
</tr>
</tbody>
</table>

(continued on next page)
<table>
<thead>
<tr>
<th>Content covered</th>
<th>Description of content</th>
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<th>Dates I will study the content</th>
<th>Date completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language in different contexts</td>
<td>Determine whether information presented in a reading selection is presented as fact or opinion</td>
<td>4</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/1/19</td>
<td>8/1/19</td>
</tr>
<tr>
<td>Contextual meaning</td>
<td>Identify the meanings of words as they are used in the context of a reading selection</td>
<td>2</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/1/19</td>
<td>8/1/19</td>
</tr>
<tr>
<td>Figurative Language</td>
<td>Understand figurative language and nuances in word meanings</td>
<td>2</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/8/19</td>
<td>8/8/19</td>
</tr>
<tr>
<td>Vocabulary range</td>
<td>Understand a range of words and phrases sufficient for reading at the college and career readiness level</td>
<td>2</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/15/19</td>
<td>8/17/19</td>
</tr>
<tr>
<td>Integration of Knowledge and Ideas</td>
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</tr>
<tr>
<td>Diverse media and formats</td>
<td>Analyze content presented in diverse media and formats, including visually and quantitatively, as well as in words</td>
<td>2</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/22/19</td>
<td>8/24/19</td>
</tr>
<tr>
<td>Evaluation of arguments</td>
<td>Identify the relationship among ideas presented in a reading selection</td>
<td>4</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/24/19</td>
<td>8/24/19</td>
</tr>
<tr>
<td>Evaluation of arguments</td>
<td>Determine whether evidence strengthens, weakens, or is relevant to the arguments in a reading selection</td>
<td>3</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/27/19</td>
<td>8/27/19</td>
</tr>
<tr>
<td>Evaluation of arguments</td>
<td>Determine the logical assumptions upon which an argument or conclusion is based</td>
<td>5</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/28/19</td>
<td>8/30/19</td>
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<tr>
<td>Evaluation of arguments</td>
<td>Draw conclusions from material presented in a reading selection</td>
<td>5</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>8/30/19</td>
<td>8/31/19</td>
</tr>
<tr>
<td>Comparison of texts</td>
<td>Recognize or predict ideas or situations that are extensions of or similar to what has been presented in a reading selection</td>
<td>4</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>9/3/19</td>
<td>9/4/19</td>
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<tr>
<td>Comparison of texts</td>
<td>Apply ideas presented in a reading selection to other situations</td>
<td>2</td>
<td>High school textbook, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>9/5/19</td>
<td>9/6/19</td>
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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.

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### Step 5: Develop Your Study Plan

<table>
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<th>Content covered</th>
<th>Description of content</th>
<th>How well do I know the content? (scale 1–5)</th>
<th>What resources do I have/need for the content?</th>
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</table>
6. 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 [https://www.ets.org/praxis/institutions/scores/passing/](https://www.ets.org/praxis/institutions/scores/passing/) 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.
7. Check on Testing Accommodations

See if you qualify for accommodations 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 Brailler
- 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 https://www.ets.org/s/praxis/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.
8. 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.
Step 9: Do Your Best on Test Day

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!
9. 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](http://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](http://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](http://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.


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](http://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 over 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](http://www.ets.org/praxis/scores/understand)
- *Praxis Passing Scores* can be found at [https://www.ets.org/praxis/institutions/scores/passing/](https://www.ets.org/praxis/institutions/scores/passing/)
- State requirements, found at [www.ets.org/praxis/states](http://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 Praxis Subject Assessment tests 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/dates_centers](http://www.ets.org/praxis/register/dates_centers) 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](http://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.

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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

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

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