Welcome to The Praxis™ Study Companion

Prepare to Show What You Know

You have gained 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 tests
- Specific information on the Praxis test you are taking
- A template study plan
- 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!
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1. Know What to Expect

Familiarize yourself with the Praxis tests so you know what to expect

Which test 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 in both computer and paper formats. Note: Not all Praxis tests are offered in both formats.

Should I take the computer- or paper-delivered test?
You should take the test in whichever format you are most comfortable. Some test takers prefer taking a paper-and-pencil test, while others are more comfortable on a computer. Please note that not all tests are available in both formats.

If I’m taking more than one Praxis test, do I have to take them all in the same format?
No. You can take each test in the format in which you are most comfortable.

Is there a difference between the subject matter covered on the computer-delivered test and the paper-delivered test?
No. The computer-delivered test and paper-delivered test cover the same content.

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 some universities, high schools, Prometric® Testing Centers, and other locations throughout the world.

Testing schedules depend on whether you are taking computer-delivered tests or paper-delivered tests. See the Praxis Web site for more detailed test registration information at www.ets.org/praxis/register.
2. Familiarize Yourself with Test Questions

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

The Praxis tests include two types of questions — multiple-choice (for which you select your answers from a list of choices) and constructed-response (for which you write a response of your own). 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 Multiple-Choice Questions

Many multiple-choice 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 one of 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 multiple-choice 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 multiple-choice 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, marking 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 multiple-choice formats are developed from time to time to find new ways of assessing knowledge. If you see a format you are not familiar with, read the directions carefully. Then read and approach the question the way you would any other question, asking yourself what you are supposed to be looking for and what details are given in the question that will help you find the answer.

Here is an example of a format you might not have encountered before:

**Directions:** The following question asks you to analyze teacher goals and actions intended to lead to the achievement of the goal. Decide whether the action is likely or unlikely to lead to the achievement of the goal.
**GOAL:** To increase the participation of low-achieving middle school students in whole-class discussions.

**ACTION:** Instead of asking for volunteers, the teacher randomly calls on students to discuss homework assignments.

(A) Likely, because students who feel anxiety about being called on will be more at ease and will pay more attention to class discussions

(B) Likely, because low-achieving students often hesitate to volunteer and random questioning will increase responses from those students

(C) Unlikely, because students in the middle school grades prefer to have a choice in responding to discussions

(D) Unlikely, because students’ positive feelings toward the teacher will decrease

To answer this question correctly you must read the directions, which explain how the paragraph marked “GOAL,” the paragraph marked “ACTION,” and the answer choices fit together. The answer is (B) because it is the only action that is both “likely” to be successful and “likely” to be the right reason. To answer this question, first decide whether the action was likely to achieve the desired goal. Then select the reason. This two-part selection process brings you to your answer.

**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 providing in-depth explanations on particular topics. Essay and problem solving 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.”

A problem-solving question might ask you to solve a mathematics problem such as the one below and show how you arrived at your solution:

a) In how many different ways can 700 be expressed as the product of two positive integers? Show how you arrived at your answer.

b) Among all pairs of positive integers whose product is 700, which pair has the maximum greatest common divisor? Explain how you arrived at your answer.
**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 circle each of the details of the question in your test book or take notes on scratch paper so that you don't miss any of them. Then you'll be sure to have all the information you need to answer the question.

For tests that have constructed-response questions, more detailed information can be found in “4. Learn About Your Test” on page 11.
3. Understand Your Scores

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

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

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

If I move to another state, will my new state accept my scores?
The Praxis Series tests are part of a national testing program, meaning that they are required in more than one state for licensure. The advantage of a national program is that if you move to another state that also requires Praxis tests, you can transfer your scores. Each state has specific test requirements and passing scores, which you can find at www.ets.org/praxis/states.

How do I know whether I passed the test?
Your score report will include information on passing scores for the states you identified as recipients of your test results. If you test in a state with automatic score reporting, you will receive passing score information for that state.

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

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

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

Put your scores in perspective
Your score report indicates:

- Your score and whether you passed
- The range of possible scores
- The raw points available in each content category
- The range of the middle 50 percent of scores on the test
- Your Recognition of Excellence (ROE) Award status, if applicable (found at www.ets.org/praxis/scores/understand/roe)

If you have taken the same test or other tests in The Praxis Series over the last 10 years, your score report also lists the highest score you earned on each test taken.
Step 3: Understand Your Scores

Content category scores and score interpretation

On many of the Praxis tests, questions are grouped into content categories. 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. Updated tests cover the same content as the previous tests. However, scores might be reported on a different scale, so requirements may vary between the new and previous versions. All scores for previous, discontinued tests are valid and reportable for 10 years.

These resources may also help you interpret your scores:

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

Learn about the specific test you will be taking

Chemistry: Content Knowledge (0245/5245)

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<th>Test Name</th>
<th>Chemistry: Content Knowledge</th>
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<tr>
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<td>Format</td>
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<td>Test Delivery</td>
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<table>
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<th>Content Categories</th>
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<th>Approximate Percentage of Examination</th>
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<tr>
<td>I. Matter and Energy; Heat, Thermodynamics, and Thermochemistry</td>
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<td>16%</td>
</tr>
<tr>
<td>II. Atomic and Nuclear Structure</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>III. Nomenclature; the Mole, Chemical Bonding, and Geometry</td>
<td>14</td>
<td>14%</td>
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<tr>
<td>IV. Periodicity and Reactivity; Chemical Reactions, Biochemistry, and Organic Chemistry</td>
<td>23</td>
<td>23%</td>
</tr>
<tr>
<td>V. Solutions and Solubility; Acid/Base Chemistry</td>
<td>12</td>
<td>12%</td>
</tr>
<tr>
<td>VI. History and Nature of Science; Science, Technology, and Social Perspectives</td>
<td>11</td>
<td>11%</td>
</tr>
<tr>
<td>VII. Mathematics, Measurement, and Data Management; Laboratory Procedures and Safety</td>
<td>14</td>
<td>14%</td>
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</tbody>
</table>

About This Test

The Chemistry: Content Knowledge test is designed to measure the knowledge and competencies necessary for a beginning teacher of secondary school Chemistry. Examinees have typically completed or nearly completed a bachelor’s degree program with appropriate coursework in chemistry and education. This test may contain some questions that will not count toward your score.

The development of the test questions and the construction of the test reflect the National Science Education Standards (NSES) and the National Science Teacher Association (NSTA) standards and recognize that there are conceptual and procedural schemes that unify the various scientific disciplines. These fundamental concepts and processes (systems; models; constancy and change; equilibrium; form and function) are useful in understanding the natural world. Insofar as possible, then, the test questions will have the primary objective of evaluating the content areas by using questions that focus on conceptual understanding, critical thinking, and problem solving in science. The test content is developed and reviewed in collaboration with practicing high
school chemistry teachers, teacher-educators, and higher education content specialists to keep the test updated and representative of current standards.

The 100 multiple-choice questions include concepts, terms, phenomena, methods, applications, data analysis, and problem solving in Chemistry, and include an understanding of the impact of science and technology on the environment and human affairs. The topics are typically those covered in introductory college-level chemistry courses, although some questions of a more advanced nature are included, because secondary school teachers must understand the subject matter from a more advanced viewpoint than that presented to their students.

Examinees will not need to use calculators in taking this test. The test book contains a periodic table of the elements and a table of information that presents various physical constants and a few conversion factors among SI units. Whenever necessary, additional values of physical constants are printed with the text of a question.

### Topics Covered

Representative descriptions of topics covered in each category are provided below.

I. **Matter and Energy; Heat, Thermodynamics, and Thermochemistry**

A. **Matter and Energy**

1. Organization of matter
   - pure substances (elements and compounds)
   - mixtures (homogeneous, heterogeneous, solutions, suspensions)
   - states of matter (solid, liquid, gas, plasma)
2. Particulate structure of matter
   - atoms, ions, molecules
3. Differences between chemical and physical properties and chemical and physical changes
   - chemical versus physical properties
   - chemical versus physical changes
   - intensive versus extensive properties
4. Conservation of energy and the conservation of matter in chemical processes
   - law of conservation of energy
   - law of conservation of matter
5. Different forms of energy
   - kinetic and potential
   - chemical, electrical, electromagnetic, nuclear, and thermal energy
   - conversions between different forms of energy within chemical systems

B. **Thermodynamics in Chemistry**

1. Temperature, thermal energy, and heat capacity, including temperature scales, units of energy, and calculations involving these concepts
   - temperature and temperature scales
   - thermal energy and units of energy
   - heat transfer
   - heat capacity and specific heat
   - calorimetry calculations
2. Concepts and calculations involving phase transitions between the various states of matter
   - phase transitions and diagrams
   - heats of vaporization, fusion, and sublimation
   - heating curves
3. Kinetic molecular theory and ideal gas laws  
   a. assumptions of the kinetic molecular theory  
   b. ideal gases and the ideal gas laws (e.g., applications, calculations)  
   c. real gas behavior  

4. Energetics of chemical reactions  
   a. exothermic and endothermic reactions  
   b. bond energy; Hess’s law  

5. How the laws of thermodynamics relate to chemical reactions and phase changes  
   a. laws of thermodynamics  
   b. spontaneous/reversible processes  
   c. change in enthalpy, entropy, and Gibbs energy in chemical/physical processes  

III. Nomenclature; the Mole, Chemical Bonding, and Geometry  

A. Nomenclature and Chemical Composition  
   1. Systematic names and chemical formulas of simple inorganic compounds  
      a. binary compounds  
      b. acids, bases, and salts  
      c. hydrates  
   2. Names of common organic compounds based on their functional groups  
      a. alkanes, alkenes, and alkynes  
      b. alcohols, ethers, ketones, aldehydes, amines  
   3. Mole concept and how it applies to chemical composition  
      a. Avogadro’s number, molar mass, and mole conversions  
      b. calculation of empirical and molecular formulas  
      c. percent composition  

B. Bonding and Structure  
   1. Common properties of bonds  
      a. relative bond lengths  
      b. relative bond strengths  
   2. Bond types  
      a. ionic bonding  
      b. covalent bonding (polar, nonpolar, hybridization)  
      c. metallic bonding  
   3. Structural formulas and molecular geometry (shape)  
      a. Lewis structures including formal charges  
      b. resonance structures  
      c. molecular geometry (shape and approximate bond angles)  
   4. Identify polar and nonpolar molecules  
      a. analysis of bonding in the molecule  
      b. symmetry of molecular structure
5. Intermolecular interactions
   a. hydrogen bonding
   b. London forces (instantaneous induced dipole-dipole)
   c. dipole-dipole
   d. dipole-induced dipole
6. How bonding and structure correlate with physical properties
   a. boiling points and melting points
   b. solubility
   c. equilibrium vapor pressure

IV. Periodicity and Reactivity; Chemical Reactions, Biochemistry, and Organic Chemistry

A. Periodicity
1. Basis of the periodic table and general layout
   a. arranged in groups and periods
   b. atomic number and mass
   c. symbols of the elements
   d. metals, nonmetals, metalloids
   e. transition elements
2. Periodic trends in physical and chemical properties of the elements
   a. atomic/ionic radius
   b. ionization energy
   c. electron affinity
   d. electronegativity
   e. physical properties (e.g., boiling/melting points, conductivity)
   f. chemical reactivity

B. Chemical Reactions and Basic Principles
1. Balancing chemical equations
   a. simple chemical equations
   b. chemical equations involving oxidation-reduction
2. Stoichiometric calculations
   a. simple calculations based on balanced chemical equations involving moles, mass, and volume
   b. limiting reagent calculations and percent yield
3. Identify, write, and predict products of simple reaction types
   a. combustion, neutralization
   b. decomposition, dehydration
   c. single and double replacement
   d. oxidation-reduction
4. Chemical kinetics
   a. rate laws, rate constants, and reaction order
   b. activation energy and reaction mechanisms including catalysts
   c. factors affecting reaction rate such as concentration, surface area, and temperature
5. Chemical reaction equilibrium
   a. equilibrium constants
   b. Le Châtelier’s principle
6. Oxidation-reduction reactions and how to determine oxidation states
   a. oxidation states
   b. identify oxidation-reduction reactions and half reactions
   c. standard reduction potentials
   d. electrochemical reactivity series
   e. electrochemical cells

C. Biochemistry and Organic Chemistry
1. Important biochemical compounds
   a. carbohydrates, including simple sugars
   b. lipids
   c. proteins and amino acids
   d. DNA and RNA
   e. products of photosynthesis and respiration
2. Common organic compounds (i.e., identify functional groups)
   a. alcohols
   b. ketones and aldehydes
   c. alkanes, alkenes, and alkynes
   d. ethers
   e. carboxylic acids
   f. amines
   g. benzene
V. Solutions and Solubility; Acid-Base Chemistry

A. Solutions and Solubility
1. Solution terminology and calculations
   a. dilute, concentrated
   b. saturated, unsaturated, supersaturated
   c. solvent, solute
   d. concentration units (e.g., molarity, molality, mole fraction, parts per million (ppm), parts per billion (ppb), percent by mass or volume)
   e. preparation of solutions of varying concentrations
2. Factors affecting solubility and dissolution rate
   a. dissolution rate (i.e., temperature, pressure, surface area, agitation)
   b. solubility and solubility curves (temperature and pressure dependent)
3. Solution phenomena based on colligative properties
   a. freezing point depression
   b. boiling point elevation
   c. vapor pressure effects
   d. osmotic pressure
4. Common applications of equilibrium in ionic solutions
   a. solubility of ionic compounds (e.g., solubility rules, slightly soluble compounds)
   b. \( K_{sp} \) calculations including percent dissociation and precipitation
   c. common ion effect
   d. electrolytes, nonelectrolytes, and electrical conductivity

B. Acid-Base Chemistry
1. Define and identify acids and bases and know their properties
   a. Arrhenius acids and bases
   b. Brønsted-Lowry acids and bases
   c. Lewis acids and bases
   d. neutralization and equivalence point
2. The pH scale and calculations involving pH and pOH
   a. pH scale
   b. calculation of pH and pOH
   c. calculation of \([H^+]\) and \([OH^-]\)
   d. knows the meaning of Kw
3. Concepts and calculations involving acid-base titrations
   a. use and selection of indicators (e.g., phenolphthalein, litmus paper)
   b. endpoint determination
   c. calculations based on titrations
4. Equilibrium relationships in acid-base chemistry
   a. strong/weak acids and bases, including common examples
   b. monoprotic and polyprotic acids
   c. \( K_a, K_b \), and percent dissociation
   d. hydrolysis (acidic and basic salts)
   e. buffer solutions

VI. History and Nature of Science; Science, Technology, and Social Perspectives

A. History and Nature of Scientific Inquiry
1. Processes involved in scientific inquiry
   a. formulating problems
   b. forming and testing hypotheses
   c. development of theories, models, and laws (postulates, assumptions)
   d. process skills including observing, concluding, comparing, inferring, categorizing, and generalizing
2. Experimental design
   a. testing hypotheses
   b. significance of controls
   c. use and identification of variables
   d. data collection planning
3. Nature of scientific knowledge
   a. subject to change
   b. consistent with experimental evidence
   c. reproducibility
   d. unifying concepts and processes (e.g., systems, models, constancy and change, equilibrium, form and function)

4. Major historical developments in chemistry and the contributions of major historical figures
   a. how current chemical principles and models developed over time
   b. major developments in chemistry (e.g., atomic model, ideal gas behavior) including major historical figures

B. Science, Technology, Society, and the Environment

1. Impact of chemistry and technology on society and the environment
   a. pharmaceuticals
   b. acid rain
   c. medical imaging
   d. air and water pollution
   e. greenhouse gases
   f. ozone layer depletion
   g. waste disposal and recycling
   h. nanotechnology

2. Applications of chemistry in daily life
   a. plastics, soap, batteries, fuel cells, and other consumer products
   b. water purification
   c. chemical properties of household products

3. Advantages and disadvantages associated with various types of energy production
   a. renewable and nonrenewable energy resources
   b. conservation and recycling
   c. pros and cons of power generation based on various sources such as fossil and nuclear fuel, hydropower, wind power, solar power, and geothermal power

VII. Mathematics, Measurement, and Data Management; Laboratory Procedures and Safety

1. Collect, evaluate, manipulate, interpret, and report data
   a. significant figures in collected data and calculations
   b. organization and presentation of data
   c. knows how to interpret and draw conclusions from data presented in tables, graphs, and charts (e.g., trends in data, relationships between variables, predictions and conclusions based on data)

2. Units of measurement, notation systems, conversions, and mathematics used in chemistry
   a. standard units of measurement
   b. unit conversion
   c. scientific notation
   d. measurement equipment

3. Basic error analysis
   a. determining mean
   b. accuracy and precision
   c. identifying sources and effects of error
   d. percent error

4. Appropriate preparation, use, storage, and disposal of materials in the laboratory
   a. appropriate use and storage
   b. safe disposal
   c. preparation for classroom use
   d. safe procedures and safety precautions

5. Appropriate use, maintenance, and calibration of laboratory equipment
   a. appropriate use and storage
   b. maintenance and calibration
   c. preparation for classroom use
   d. safety procedures and precautions when using equipment

6. Safety procedures and precautions for the high school chemistry laboratory
   a. location and use of standard safety equipment such as eyewash and shower
   b. laboratory safety rules for students
   c. appropriate apparel and conduct in the laboratory, such as wearing goggles
   d. emergency procedures
5. 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 in “4. Learn About Your Test” on page 11 section, 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 college library have a good introductory college-level textbook in this area?
• Does your local library have a high school-level textbook?

Study guides are available for purchase for many Praxis tests at www.ets.org/praxis/testprep. Each guide provides a combination of test preparation and practice, including 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 at www.ets.org/praxis/register/centers_dates.
• Work backward from that date to figure out how much time you will need for review.
• Set a realistic schedule—and stick to it.
5) Practice explaining the key concepts.

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

6) Understand how questions will be scored.

Scoring information can be found in “3. Understand Your Scores” on page 9.

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 22 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 20 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 11 to select topics, and then select practice questions, beginning on page 26.

- **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 the practice test together.** The idea of the 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.** Score one another’s answer sheets. 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.
6. 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 *Praxis I® Pre-Professional Skills Test: 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 “Topics Covered” information beginning on page 11 to help complete it.

Use this worksheet to:

1. Define Content Areas: List the most important content areas for your test as defined in the Topics Covered section.
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:</th>
<th><em>Praxis I® Pre-Professional Skills Test: Reading</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Praxis Test Code(s):</td>
<td>0710</td>
</tr>
<tr>
<td>Test Date:</td>
<td>11/15/12</td>
</tr>
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</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>
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</thead>
<tbody>
<tr>
<td><strong>Literal Comprehension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Ideas</td>
<td>Identify summaries or paraphrases of main idea or primary purpose of reading selection</td>
<td>2</td>
<td>Middle school English text book</td>
<td>College library, middle school teacher</td>
<td>9/15/12</td>
<td>9/15/12</td>
</tr>
<tr>
<td>Supporting Ideas</td>
<td>Identify summaries or paraphrases of supporting ideas and specific details in reading selection</td>
<td>2</td>
<td>Middle school English text book</td>
<td>College library, middle school teacher</td>
<td>9/17/12</td>
<td>9/17/12</td>
</tr>
<tr>
<td>Organization</td>
<td>Identify how reading selection is organized in terms of cause/effect and compare/contrast</td>
<td>3</td>
<td>Middle and high school English text book</td>
<td>College library, middle and high school teachers</td>
<td>9/20/12</td>
<td>9/21/12</td>
</tr>
<tr>
<td>Organization</td>
<td>Identify key transition words/phrases in reading selection and how used</td>
<td>4</td>
<td>Middle and high school English text book</td>
<td>College library, middle and high school teachers</td>
<td>9/25/12</td>
<td>9/26/12</td>
</tr>
<tr>
<td>Vocabulary in Context</td>
<td>Identify meanings of words as used in context of reading selection</td>
<td>3</td>
<td>Middle and high school English text book, dictionary</td>
<td>College library, middle and high school teachers</td>
<td>9/25/12</td>
<td>9/27/12</td>
</tr>
</tbody>
</table>

(continued on next page)
### Critical and Inferential Comprehension

<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>Evaluation</td>
<td>Determine whether evidence strengthens, weakens, or is relevant to arguments in reading selection</td>
<td>5</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/1/12</td>
<td>10/1/12</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Determine role that an idea, reference, or piece of information plays in author’s discussion/argument</td>
<td>5</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/1/12</td>
<td>10/1/12</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Determine if information presented is fact or opinion</td>
<td>4</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/1/12</td>
<td>10/1/12</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Identify relationship among ideas presented in reading selection</td>
<td>2</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/1/12</td>
<td>10/1/12</td>
</tr>
<tr>
<td>Inferential Reasoning</td>
<td>Draw inferences/implications from directly stated content of reading selection</td>
<td>3</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/8/12</td>
<td>10/8/12</td>
</tr>
<tr>
<td>Inferential Reasoning</td>
<td>Determine logical assumptions on which argument or conclusion is based</td>
<td>2</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/8/12</td>
<td>10/8/12</td>
</tr>
<tr>
<td>Inferential Reasoning</td>
<td>Determine author’s attitude toward materials discussed in reading selection</td>
<td>1</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/15/12</td>
<td>10/17/12</td>
</tr>
<tr>
<td>Generalization</td>
<td>Recognize or predict ideas/situations that are extensions of, or similar to, what has been presented in reading selection</td>
<td>2</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/22/12</td>
<td>10/24/12</td>
</tr>
<tr>
<td>Generalization</td>
<td>Draw conclusions from materials presented in reading selection</td>
<td>3</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/24/12</td>
<td>10/24/12</td>
</tr>
<tr>
<td>Generalization</td>
<td>Apply ideas presented in a reading selection to other situations</td>
<td>3</td>
<td>High school text book, college course notes</td>
<td>College library, course notes, high school teacher, college professor</td>
<td>10/27/12</td>
<td>10/27/12</td>
</tr>
</tbody>
</table>
# My Study Plan

Use this worksheet to:

1. **Define Content Areas:** List the most important content areas for your test as defined in the Learn about Your Test and Topics Covered sections.
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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<th>Content covered</th>
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</table>
7. Review Smart Tips for Success

Follow test-taking tips developed by experts

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

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

Can I answer the questions in any order?
Yes. You can go through the questions from beginning to end, as many test takers do, or you can create your own path. Perhaps you will want to answer questions in your strongest area of knowledge first and then move from your strengths to your weaker areas. On computer-delivered tests, you can use the “Skip” function to skip a question and come back to it later. There is no right or wrong way. Use the approach that works best for you.

Are there trick questions on the test?
No. There are no hidden meanings or trick wording. 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 multiple-choice tests follow patterns. Another myth is that there will never be more than two questions with the same lettered answer following each other. Neither myth is true. Select the answer you think is correct based on your knowledge of the subject.

Can I write in the test booklet or, for a computer-delivered test, on the scratch paper I am given?
Yes. You can work out problems right on the pages of the booklet or scratch paper, make notes to yourself, mark questions you want to review later or write anything at all. Your test booklet or 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 mark your answers on the answer sheet or enter them on the computer.

Smart Tips for Taking the Test

1. For a paper-delivered test, put your answers in the right bubbles. It seems obvious, but be sure that you fill in the answer bubble that corresponds to the question you are answering. A significant number of test takers fill in a bubble without checking to see that the number matches the question they are answering.

2. Skip the questions you find extremely difficult. Rather than trying to answer these on your first pass through the test, leave them blank and mark them in your test booklet. 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.

3. **Keep track of the time.** Bring a watch to the test, just in case the clock in the test room is difficult for you
to see. Keep the watch as simple as possible—alarms and other functions may distract others or may violate
test security. If the test center supervisor suspects there could be an issue with your watch, they will ask you
to remove it, so simpler is better! You will probably have plenty of time to answer all of the questions, but if
you find yourself becoming bogged down in one section, you might decide to move on and come back to
that section later.

4. **Read all of the possible answers before selecting one.** Then reread the question to be sure the answer
you have selected really answers 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.

5. **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.

6. **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 similar-looking
(but in fact very different) 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 Series tests at
http://www.ets.org/s/praxis/pdf/passing_scores.pdf or on the Web site of the state for which you are
seeking certification/licensure.

7. **Use your energy to take the test, not to get angry at it.** Getting angry at the test only increases stress
and decreases the likelihood that you will do your best. Highly qualified educators and test development
professionals, all with backgrounds in teaching, worked diligently to make the test a fair and valid measure
of your knowledge and skills. Your state painstakingly reviewed the test before adopting it as a licensure
requirement. The best thing to do is concentrate on answering the questions.
8. Practice with Sample Test Questions

Answer practice questions and find explanations for correct answers

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. In a laboratory experiment, crystals are heated in a dry glass test tube using a Bunsen burner. During heating, a clear liquid is observed inside the mouth of the test tube. Which of the following is the most reasonable conclusion drawn from this observation?

   (A) The gas fuel used to heat the crystals forms water as it burns.
   (B) The crystals give off water when heated.
   (C) The crystals give off both hydrogen and oxygen gases that combine to form water.
   (D) Condensation from the air collects on the test tube as the crystals are heated.

2. Suppose that a mixture of 8 g of sugar, 5.20 g of salt, and 100.01 g of flour is prepared. What is the total mass of the mixture expressed in exponential notation and with the correct number of significant figures?

   (A) $1 \times 10^2$
   (B) $1.1 \times 10^2$
   (C) $1.13 \times 10^2$
   (D) $1.132 \times 10^2$

3. Use of a small quantity of which of the following gases in a classroom requires special consideration because the gas is poisonous?

   (A) Steam
   (B) Hydrogen
   (C) Hydrogen sulfide
   (D) Carbon dioxide

4. A sample of a pure solid substance is heated at a constant rate and its temperature recorded as a function of time. A graph of the data is shown above. At about what temperature is the heat added being used to melt the substance?

   (A) 25°C
   (B) 41°C
   (C) 53°C
   (D) 60°C

5. Changes in which the entropy of the system increases include which of the following?

   I. Melting ice at room temperature
   II. Evaporating water at room temperature
   III. Dissolving NaCl in room-temperature water

   (A) I only
   (B) III only
   (C) I and II only
   (D) I, II, and III
6. Isotopic Mass Percent Abundance

<table>
<thead>
<tr>
<th>Isotope</th>
<th>(amu)</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>40.9</td>
<td>10.0%</td>
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<tr>
<td>44</td>
<td>43.9</td>
<td>30.0%</td>
</tr>
<tr>
<td>46</td>
<td>45.9</td>
<td>60.0%</td>
</tr>
</tbody>
</table>

A fictional element with the three naturally occurring isotopes described above would be listed in the periodic table with an atomic mass of

(A) 42.1
(B) 43.6
(C) 44.8
(D) 45.9

7. In an attempt to compare the half-lives of two radioactive elements, X and Y, a scientist set aside 400 g of each. After six months, the scientist found that 25 g of X and 200 g of Y remained. Which of the following statements is true?

(A) The half-life of Y is twice the half-life of X.
(B) The half-life of Y is four times the half-life of X.
(C) The half-life of Y is eight times the half-life of X.
(D) Unless the exact time interval is established, a comparison cannot be made.

8. Which of the following statements is correct about any chemical reaction that is at equilibrium?

(A) The molecules stop reacting.
(B) Only side reactions continue; the main reaction stops.
(C) Forward and backward reactions occur at equal rates.
(D) There are as many molecules of reactant as there are molecules of product.

9. Which, if any, of the following structural formulas represent the same compound?

<table>
<thead>
<tr>
<th>Structure I</th>
<th>Structure II</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH₂−C−CH₃</td>
<td>CH₃−C−CH₃</td>
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<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure III</th>
<th>Structure IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>H−CH₃</td>
<td>H₃C−CH₃</td>
</tr>
<tr>
<td>C≡C</td>
<td>C≡C</td>
</tr>
</tbody>
</table>

(A) I and II only
(B) III and IV only
(C) I, II, III, and IV
(D) None of the formulas represent identical compounds.

10. The correct formula for copper (I) sulfate is

(A) CuSO₄
(B) Cu₂SO₄
(C) Cu₄SO
(D) Cu₄SO₄

11. The pH of a 4.0 × 10⁻⁴ M HCl solution is between

(A) 2 and 3
(B) 3 and 4
(C) 4 and 5
(D) 5 and 6

12. \[ Ag^+ + e^- \rightarrow Ag(s) \quad E^{0} = +0.80 \text{ V} \]
\[ Cr^{3+} + 3e^- \rightarrow Cr(s) \quad E^{0} = -0.74 \text{ V} \]

Based on the standard reduction potentials for chromium and silver shown above, what is the cell potential for the reaction below?

\[ 3Ag^+ + Cr(s) \rightarrow 3Ag(s) + Cr^{3+} \]

(A) 0.06 V
(B) 1.54 V
(C) 1.66 V
(D) 3.14 V
13. Which of the following is an important function of carbohydrates in living organisms?
   (A) They are the primary component of enzymes.
   (B) They constitute a source of energy for the organism.
   (C) They contain the genetic information of the cell.
   (D) They comprise structural parts such as cartilage and tendons.

14. Liquids with molecules held together by van der Waals forces have which of the following properties?
   (A) High solubilities in water
   (B) High melting points
   (C) Low boiling points
   (D) Significant electrical conductivities in the solid phase

15. The solubility product, $K_{sp}$ for Mg(OH)$_2$ is $1.0 \times 10^{-11}$. What is the concentration of Mg$^{2+}$ in a saturated solution of this base?
   (A) $\sqrt{5.0 \times 10^{-12}}$ M
   (B) $\sqrt{1.0 \times 10^{-11}}$ M
   (C) $\sqrt[3]{2.5 \times 10^{-12}}$ M
   (D) $\sqrt[3]{1.0 \times 10^{-11}}$ M

16. When 0.50 mol of octane, C$_8$H$_{18}$, is burned completely and the reaction products are brought to 20°C and 1 atmosphere, the products include approximately
   (A) 18 moles of water
   (B) Close to 100 liters of carbon dioxide
   (C) Close to 180 liters of carbon dioxide
   (D) Close to 200 liters of water vapor

17. Which of the following properties of a substance depends on the amount of the sample?
   (A) Temperature
   (B) Half-life
   (C) Density
   (D) Inertia

18. What quantity of oxygen, O$_2$, contains very nearly the same number of molecules as 36.0 grams of water, H$_2$O?
   (A) 64.0 grams
   (B) 32.0 grams
   (C) 16.0 grams
   (D) 8.0 grams

19. In the reaction of solutions of silver nitrate and sodium phosphate, a silver precipitate is formed. The balanced ionic equation for this reaction is
   (A) $\text{Ag}^+ + \text{PO}_4^{3-} \rightleftharpoons \text{Na}^+ + \text{AgPO}_4(s)$
   (B) $\text{Ag}^+ + \text{PO}_4^{3-} \rightleftharpoons \text{AgPO}_4(s)$
   (C) $3\text{Ag}^+ + \text{PO}_4^{3-} \rightleftharpoons \text{Ag}_3\text{PO}_4(s)$
   (D) $4\text{Ag}^+ + \text{PO}_4^{3-} \rightleftharpoons \text{Ag}_4\text{PO}_4(s)$

20. The two elements in which of the following pairs have a valence of +3?
   (A) Al and Ga
   (B) N and O
   (C) Li and Na
   (D) F and Cl
Answers to Sample Questions

1. The crystals when heated may give off water in the form of steam. When this moist air reaches the top of the tube, condensation occurs inside the top of the tube because the tube is cooler than the rising warmer air. The correct answer is (B).

2. For addition, the correct number of significant figures to the right of the decimal point in the answer is the same as the smallest number of digits to the right of the decimal point in any of the terms to be added. In this example, that number is zero, which gives 113 as the total mass of the mixture to the correct number of significant figures. The number is then converted to exponential notation. The correct answer is (C).

3. Of the gases listed, only hydrogen sulfide is poisonous in small quantities. The correct answer is (C).

4. When a substance is heated, its temperature increases unless it is undergoing a phase change. During melting, the temperature remains constant since the energy absorbed is being used to do work against the attractive forces in becoming liquid particles. In the diagram, melting begins around nine minutes and a temperature around 53°C. The correct answer is (C).

5. Entropy is a measure of disorder. In all three cases, the disorder of the system increases. The correct answer is (D).

6. A quick calculation using the isotope number, 
\[(0.1 \times 40.9) + (0.3 \times 43.9) + (0.6 \times 45.9) = 44.8,\] gives the correct answer, (C).

7. Element X decayed from 400 g to 25 g, in a time period of 4 half-lives. Element Y decayed from 400 g to 200 g, in a time period of 1 half-life. Y decays slower than X, and the half-life of Y is 4 times that of X. The correct answer is (B).

8. The correct answer is (C). The definition of an equilibrium is that the forward and backward reactions occur at equal rates.

9. The correct answer is (A). I and II are the same compound, 2-methyl-1-propene. III and IV are cis and trans isomers. They are geometric isomers with different properties.

10. The correct answer is (B). Copper (I) is \(\text{Cu}^+\) and sulfate is \(\text{SO}_4^{2-}\); therefore, for charge neutrality the compound is \(\text{Cu}_2\text{SO}_4\).

11. (B) is the correct answer. HCl dissociates completely, \([\text{H}^+] = 4.0 \times 10^{-4} \text{ M}\) and the pH is between 3 and 4.

12. The correct answer is (B).
\[E = E^0(\text{Ag}) - E^0(\text{Cr}) = 0.80 + 0.74 = 1.54\]

13. (B) is the correct answer. Carbohydrates are broken down to glucose during digestion, and glucose is oxidized in the cell to produce energy in the form of ATP.

14. Van der Waals forces is the collective name for weak attractive forces between molecules. In general, liquids held together only by these forces have low boiling points relative to their molecular weights since only weak forces must be overcome during vaporization. Thus, (C) is the correct answer.

15. The \(K_{sp}\) of a salt is the product of the ion concentrations in a saturated solution. In the present case, \(K_{sp} = [\text{Mg}^{2+}] [\text{OH}^-]^2\).
Since \([\text{OH}^-] = 2[\text{Mg}^{2+}]\),
\[K_{sp} = [\text{Mg}^{2+}][2(\text{Mg}^{2+})]^2 = 4[\text{Mg}^{2+}]^3 = 1.0 \times 10^{-11}\, .\]
Solving for \([\text{Mg}^{2+}]\) one obtains \([\text{Mg}^{2+}] = [1.0 \times 10^{-11} / 4]^{1/3}\). The correct answer is (C).

16. The equation for the reaction is
\[2\text{C}_8\text{H}_{18} + 25 \text{O}_2 \rightarrow 16 \text{CO}_2 + 18 \text{H}_2\text{O} .\]
(B) is correct; 0.5 mol octane produces 4 mol of CO\(_2\), which, at 20°C, occupies \((4 \text{ mol} \times 22.4 \text{L/mol}) \times \frac{293 \text{K}}{273 \text{K}} = 96 \text{L} \equiv 100 \text{L}\)

17. Inertia is a property of a substance, proportional to its mass, and therefore depends on the amount of the sample. The correct answer is (D).

18. The correct answer is (A). Thirty-six grams of water is 2 moles (2 x 18 grams). A 2-mole sample of O\(_2\) contains the same number of molecules as does 2 moles of any other substance. A 2-mole sample of O\(_2\) would have a mass of 2 x 32.0 grams = 64.0 grams.
19. The correct answer is (C). The precipitate formed is Ag₃PO₄. Atoms and net charge must be conserved in a chemical reaction, so the reactants and products must have equal numbers of each type of atom and the same net charge.

20. The correct answer is (A). The valences of Al and Ga are both +3.
9. Check on Testing Accommodations

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

**What if English is not my primary language?**

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

**What if I cannot take the paper-based test on Saturday?**

Monday is the alternate paper-delivered test day for test takers who can’t test on Saturday due to:

- religious convictions
- duties as a member of the United States armed forces

Online registration is not available for Monday test takers. You must complete a registration form and provide a photocopy of your military orders or a letter from your cleric. You'll find details at [www.ets.org/praxis/register/accommodations/monday_testing](http://www.ets.org/praxis/register/accommodations/monday_testing).

**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 (14 pt.)
- Large print answer sheet
- Listening section omitted

For more information on these accommodations, visit [www.ets.org/praxis/register/disabilities](http://www.ets.org/praxis/register/disabilities).

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

You can find additional information on available resources for test takers with disabilities or health-related needs at [www.ets.org/disabilities](http://www.ets.org/disabilities).
10. Do Your Best on Test Day

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

You followed your study plan. You are 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 and bring food with you to eat during break to keep your energy level up
• bring an acceptable and valid photo identification with you
• bring a supply of well-sharpened No. 2 pencils (at least 3) and a blue or black pen for the essay or constructed-response tests
• be prepared to stand in line to check in or to wait while other test takers check in
• select a seat away from doors, aisles, and other high-traffic areas

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 necessary 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
• scrap paper
• any electronic, photographic, recording, or listening devices

Note: All cell phones, smart phones (e.g., BlackBerry®, devices, iPhones®, etc.), PDAs, 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 items?
- 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!
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 pedagogical skills and knowledge that beginning teachers need. The tests do not measure an individual's disposition toward teaching or potential for success. 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.

What are the Praxis I tests?
The Praxis I tests measure basic skills in reading, writing, and mathematics. All these tests include multiple-choice questions and the Writing test also includes an essay question. Praxis I tests are designed to evaluate whether you have the academic skills needed to prepare for a career in education.

What are the Praxis II tests?
Praxis II Subject Assessments measure knowledge of specific subjects that K–12 educators teach, as well as general and subject-specific teaching skills and knowledge. Ranging from Agriculture to World Languages, there are more than 130 Praxis II tests, which contain multiple-choice or constructed-response questions, or a combination of both.

What is the difference between Praxis multiple-choice and constructed-response tests?
Multiple-choice tests measure a broad range of knowledge across your content area. Constructed-response tests measure your ability to provide in-depth explanations of a few essential topics in a given subject area. Content-specific Praxis II pedagogy tests, most of which are constructed-response, measure your understanding of how to teach certain fundamental concepts in a subject area.

The tests do not measure your actual teaching ability, however. Teaching combines many complex skills that are typically measured in other ways, including classroom observation, videotaped practice, or portfolios not included in the Praxis test.

Who takes the tests and why?
Some colleges and universities use the Praxis I tests to evaluate individuals for entry into teacher education programs. The assessments are generally taken early in your college career. Many states also require Praxis I scores as part of their teacher licensing process.

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

Do all states require these tests?
The Praxis Series 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 it assesses the entire body of knowledge for the field you are entering, preparing for a licensure exam takes planning, discipline, and sustained effort.

Why does my state require The Praxis Series tests?

Your state chose The Praxis Series 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 Series test development process. First, ETS asked them which 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 multiple-choice 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.

Appendix: Other Questions You May Have

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 existing test specifications and to evaluate test forms for alignment with the specifications.

How long will it take to receive my scores?

Scores for computer-delivered tests are available faster than scores for paper-delivered tests. Scores for most computer-delivered multiple-choice tests are reported on the 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 scores for computer-delivered tests are reported to you and your designated score recipients approximately two to three weeks after the test date. Scores for paper-delivered tests will be available within four weeks after the test date. See the test dates and deadlines calendar at www.ets.org/praxis/register/centers_dates for exact score reporting dates.

Can I access my scores on the Web?

All test takers can access their test scores via their 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 in to your Praxis account at www.ets.org/praxis and click on your score report. If you do not already have a Praxis account, you must create one to view your scores.

Note: You must create a Praxis account to access your scores, even if you registered by mail or phone.
Your teaching career is worth preparing for, so start today!
Let the Praxis™ Study Companion guide you.

To search for the Praxis test prep resources that meet your specific needs, visit:
www.ets.org/praxis/testprep

To purchase official test prep made by the creators of the Praxis tests, visit the ETS Store:
www.ets.org/praxis/store