

The *Praxis*® Study Companion

# Computer Science

5651



# 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 Series*® 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
- Test specifications
- 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](http://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 37).

### **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](http://www.ets.org/praxis/register).

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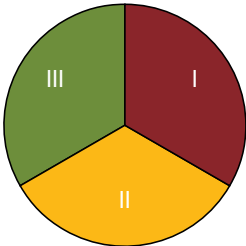
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# 1. Learn About Your Test

*Learn about the specific test you will be taking*

## Computer Science (5651)

Test at a Glance			
Test Name	Computer Science		
Test Code	5651		
Time	3 hours		
Number of Questions	100		
Format	Selected-response questions		
Test Delivery	Computer delivered		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Test
	I. Technology Applications Core	33–34	33.3%
	II. Program Design and Development	33–34	33.3%
	III. Programming Language Topics	33–34	33.3%

### About This Test

The *Praxis* Computer Science (5651) test is designed to assess the knowledge, skills, and abilities necessary for a beginning teacher of computer science. Examinees have typically completed or nearly completed a bachelor’s degree program with appropriate coursework in computer science and education.

The test covers three major content categories: technology applications core, program design and development, and programming language topics. The test is three hours long and contains 100 selected-response questions. For each question, the test taker is to select one answer from a list of four answer choices. Use of calculators is not allowed. The program fragments used in the questions are written in pseudocode and are not based on any specific programming language. Code segment examples are provided on page 10.

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

## Test Specifications

Test specifications describe the knowledge and skills measured by the test.

### I. Technology Applications Core

#### A. The computer science teacher knows technology terminology and concepts; the appropriate use of hardware, software, and digital files; and how to acquire, analyze, and evaluate digital information.

1. Knows technology terminology and concepts.
2. Demonstrates knowledge of various types of networks (e.g., LAN, WAN) and models for defining network standards and protocols (e.g., OSI, TCP/IP).
3. Knows the appropriate use of hardware components (e.g., input, processing, output, primary/secondary storage devices), operating systems, software applications, and networking components
4. Knows how to select, connect, and use a variety of input, output, and storage devices and peripherals (e.g., scanner, voice/sound recorders, touch screen, digital camera, printer).
5. Knows how to evaluate software (e.g., graphics, animation, multimedia, video, Web authoring) for quality, appropriateness, effectiveness, and efficiency and how to make decisions regarding its proper acquisition and use.
6. Knows how to perform basic application functions (e.g., opening an application program; creating, modifying, saving, and printing documents) and how to access, manage, and manipulate information from secondary storage devices.
7. Knows strategies for acquiring information from electronic resources (e.g., encyclopedias, databases, libraries of images, reference software, Internet).
8. Knows search strategies (e.g., keyword, Boolean, natural language) for locating and retrieving information in electronic formats (e.g., text, audio, video, graphics).
9. Knows how to assess the accuracy and validity of acquired information.
10. Knows how to resolve information conflicts through research and comparison of data from multiple sources.
11. Demonstrates knowledge of the ethical acquisition (e.g., citing sources using established methods) and acceptable versus unacceptable use of information (e.g., privacy, hacking, piracy, vandalism, viruses, current laws and regulations).
12. Demonstrates knowledge of intellectual property rights and related issues (e.g., copyright laws, fair use, patents, trademarks) when using, manipulating, and editing electronic data.
13. Knows how to use online help and other support documentation.
14. Knows how to use technical-writing strategies to develop documentation for a variety of communication products.
15. Demonstrates knowledge of the impact of technology on society and the importance of technology to future careers, lifelong learning, and daily living for individuals of all ages.
16. Investigates measures (e.g., passwords, virus detection/prevention) to protect computer systems and databases from unauthorized use and tampering.

#### B. The computer science teacher knows how to use technology tools to solve problems, evaluate results, and communicate information in a variety of formats for diverse audiences.

1. Knows how to plan, create, and edit documents using word processing features (e.g., readable fonts, alignment, page setup, tabs, ruler settings) to solve problems and communicate results.
2. Knows how to plan, create, and edit spreadsheets using spreadsheet features (e.g., data types, formulas, functions, charts) to solve problems and communicate results.
3. Knows how to plan, create, and edit databases using database features (e.g., defining fields, entering data, creating horizontal and vertical layouts) to solve problems and communicate results.
4. Knows how to integrate one or more objects (e.g., tables, charts, graphs, graphics) into a product.
5. Knows how to use productivity tools to create products (e.g., slide shows, posters, multimedia presentations, spreadsheets) for defined audiences.
6. Knows how to publish information in a variety of ways (e.g., printed copy, monitor displays, Internet documents, video).

7. Knows how to use telecommunications tools (e.g., Internet browsers, video conferencing, distance learning) for a variety of purposes.
  8. Knows how to use interactive virtual environments (e.g., virtual field trips, instructional simulations).
  9. Knows how to use collaborative software.
  10. Knows how to share information through online communication.
  11. Demonstrates knowledge of issues concerning proper etiquette when communicating using electronic tools.
  12. Demonstrates knowledge of how to design and implement procedures to track trends, set timelines, and review and evaluate products using technology tools (e.g., database managers, daily/monthly planners, project management tools)
  13. Knows how to evaluate projects for design, purpose, audience, and content delivery using various criteria (e.g., technology specifications, established criteria, rubrics)
  14. Knows how to select representative products to be collected and stored in an electronic evaluation tool and how to evaluate products for relevance to the assignment or task
  15. Knows how to plan and design communication products that are accessible to learners with diverse needs and abilities
- C. The computer science teacher knows how to plan, organize, deliver, and evaluate instruction that effectively utilizes current technology for teaching technology applications for all students.**
1. Knows how to plan computer science lessons using a range of instructional strategies for individuals and groups
  2. Demonstrates knowledge of issues related to the equitable use of technology (e.g., gender, ethnicity, language, disabilities, access to technology)
  3. Knows how to plan and implement instruction that allows students to use computer science in problem-solving and decision-making situations
  4. Knows how to develop and facilitate collaborative tasks and teamwork among group members
  5. Knows how to use technology tools to perform administrative tasks (e.g., attendance, grades, communication)
  6. Knows how to use a variety of instructional strategies to ensure students' reading comprehension
  7. Knows strategies to help students learn how to locate, retrieve, analyze, evaluate, communicate, and retain content-related information
  8. Knows how to evaluate student projects and portfolios using formal and informal assessment methods
  9. Knows the relationship between instruction and assessment and uses assessment results for gauging student progress and adjusting instruction
  10. Identifies resources to keep current with the use of technology in education and issues related to legal and ethical use of technology resources
  11. Knows how to use technology to participate in self-directed activities in society and how to participate within electronic communities in a variety of roles (e.g., collaborator, learner, contributor, teacher/mentor)

## II. Program Design and Development

### A. The computer science teacher knows problem-solving strategies and different procedures for program design.

1. Exhibits knowledge of the analysis and design phases of the software system life cycle.
2. Knows the characteristics of programming design strategies.
3. Knows how to apply problem-solving strategies (e.g., design specification, top-down design, step-wise refinement, object-oriented design).
4. Demonstrates the ability to compare and contrast design strategies (e.g., top-down, bottom-up, object-oriented).
5. Demonstrates the use of visual organizers (e.g., flowcharts, schematic drawings) to design solutions to problems.
6. Knows how to create robust programs with emphasis on design to facilitate maintenance, program expansion, reliability, validity, and efficiency.



**B. The computer science teacher knows procedures for software development and implementation.**

1. Knows the characteristics of models (e.g., waterfall, incremental, spiral) used in the development of software systems.
2. Knows how to survey the issues accompanying the development of large software systems (e.g., design/implementation teams, software validation/testing, risk assessment).
3. Demonstrates the use of programming style conventions (e.g., spacing, indentation, descriptive identifiers, comments, documentation) to enhance the readability and functionality of code.
4. Knows how to create robust programs with emphasis on style, clarity of expression, and documentation to facilitate maintenance, program expansion, reliability, validity, and efficiency.
5. Knows how to create and use libraries of generic modular code to be used for efficient programming.
6. Demonstrates the ability to read and modify large programs, including design description and process development.
7. Demonstrates effective use of predefined input and output, including logic to protect from invalid input.
8. Demonstrates the ability to debug and solve problems using reference materials and effective strategies.
9. Knows how to determine and employ methods to evaluate the design and functionality of information acquisition processes and algorithms, using effective coding, design, and test data.

**C. The computer science teacher knows computer science terminology and concepts and the characteristics of different programming languages and paradigms.**

1. Knows necessary vocabulary related to computer science (e.g., cache, bits, encryption).
2. Knows specific programming terminology (e.g., data type, data structure, encapsulation) and programming concepts (e.g., procedural, object-oriented).
3. Demonstrates knowledge of advanced computer science concepts (e.g., computer architecture, operating systems, artificial intelligence).
4. Demonstrates the ability to use notation for language definition (e.g., syntax diagrams, Backus-Naur forms).
5. Knows the differences in the levels of languages (e.g., machine, assembly, high-level compiled, interpreted).
6. Knows the characteristics of and differences in current programming languages and paradigms.
7. Demonstrates knowledge of the uses of current programming languages and paradigms in other fields of study.



### III. Programming Language Topics

#### A. The computer science teacher correctly and efficiently uses data types, data structures, and functions in the development of code.

1. Knows the characteristics and uses of constants, variables, and simple data types in current programming languages (e.g., int, short, char, double, boolean).
2. Demonstrates effective use of standard and user-defined methods or functions in the development of code.
3. Knows how to identify and use parameters, both actual and formal, and how to pass parameters by value and by reference.
4. Knows how to identify object-oriented data types and delineate the advantages and disadvantages of object data.
5. Demonstrates the ability to identify and use one-dimensional arrays, records, and sequential and nonsequential files.
6. Knows how to identify and use multidimensional arrays and arrays of records.
7. Demonstrates the ability to develop coding with the use of data structures, and to manipulate data structures using string processing routines (e.g., concatenation of strings, substring search).
8. Knows the characteristics of and develops code using abstract data types (e.g., stacks, queues, linked lists, trees, graphs).

#### B. The computer science teacher correctly and efficiently uses statements and control structures in the development of code.

1. Applies standard operators (e.g., arithmetic, relational, logical, assignment, increment/decrement, input/output) and correct operator precedence.
2. Identifies the characteristics of control structures.

3. Uses conditional control structures (e.g., if, if . . . else statements).
4. Constructs iterative control structures (e.g., for and while statements, do loops).
5. Uses pretest (e.g., for, while) and posttest (e.g., do . . . while) loops.
6. Uses sequential, conditional, selection, and repetition execution control structures such as menu-driven programs that branch and allow user input.
7. Demonstrates coding proficiency in contemporary programming languages, including an object-oriented language.

#### C. The computer science teacher knows how to construct, compare and analyze various algorithms.

1. Constructs searching algorithms (e.g., linear and binary searches).
2. Constructs sorting algorithms (e.g., selection, bubble, insertion, merge, shell, and quick sorts).
3. Compares and contrasts searching and sorting algorithms for space and time requirements.
4. Constructs and appropriately uses iterative and recursive algorithms.
5. Compares and contrasts iterative and recursive algorithms.
6. Develops sequential, iterative, and recursive algorithms and code programs in prevailing computer languages to solve practical problems.
7. Analyzes various algorithms using “big-O” notation and best-, average-, and worst-case space and time techniques.
8. Identifies and describes the correctness and complexity of specific types of algorithms (e.g., divide and conquer, greedy, backtracking).

## Code Segments

### Example 1

The following are some examples of pseudocode stimulus material.

Class declaration and object instantiation

```
class StudentInfo
  int studentID
  string name
end class StudentInfo

StudentInfo x  $\leftarrow$  new StudentInfo()
x.studentID  $\leftarrow$  1234
  // the value 1234 is assigned to x.studentID
x.name  $\leftarrow$  "John"
print ( x.studentID )
print ( x.name )
```

### Example 2

The following procedure uses different parameter-passing mechanisms for the two parameters.

```
void f ( pass-by-reference int x, pass-by-value int y )
  x  $\leftarrow$  y + 1
  y  $\leftarrow$  x + 2
end f
```

### Example 3

InsertionSort

```
// precondition 1: A is an array of integers.
// precondition 2: The length of array A is n.
// precondition 3: The index of array A starts at 0.
int[] insertionSort ( pass-by-reference int[] A, int n )
  for ( int j  $\leftarrow$  1; j  $\leq$  n - 1; j  $\leftarrow$  j + 1 )
    int temp  $\leftarrow$  A[j]
    int k  $\leftarrow$  j - 1
    while ( ( k  $\geq$  0 ) and ( A[k] > temp ) )
      A[k + 1]  $\leftarrow$  A[k]
      k  $\leftarrow$  k - 1
    end while
    A[k + 1]  $\leftarrow$  temp
  end for
  return A // returns the sorted array
end insertionSort
```

## 2. Familiarize Yourself with Test Questions

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

The *Praxis Series* 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 options.

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

- **Clicking more than one oval** to select answers from a list of options.
- **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 options and drag your answers to the appropriate location in a table, paragraph of text or graphic.
- **Selecting options from a drop-down menu.** You may be asked to choose answers by selecting options from a drop-down menu (e.g., to complete a sentence).

Remember that with every question you will get clear instructions.

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

## Understanding Selected-Response Questions

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

**Which of the following is a flavor made from beans?**

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

### How would you answer this question?

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

Try following these steps to select the correct answer.

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

### Try a more challenging example

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

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

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

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

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

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

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

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

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

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

### How to approach unfamiliar formats

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

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

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

## Understanding Constructed-Response Questions

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

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

Take a look at a few sample essay topics:

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

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

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

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

For tests that have constructed-response questions, more detailed information can be found in "1. Learn About Your Test" on page 5.

## 3. Practice with Sample Test Questions

*Answer practice questions and find 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 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 the principal advantage of saving a word processing document in rich-text format?
  - (A) The document can be viewed in any Web browser.
  - (B) A formatted document can be transferred between different applications.
  - (C) The document can take up less space in memory.
  - (D) A formatted document can be scanned for viruses when sent as an e-mail attachment.
2. Which of the following would most likely be considered unacceptable use of information by a teacher?
  - (A) Using the school district's database to determine gender distribution in local schools
  - (B) Using the Internet history on a classroom computer to audit student Internet use
  - (C) Using students' personal data to create a mailing list for a local charity
  - (D) Using classroom records to determine recipients of academic awards
3. Students in a Texas classroom have been communicating with a class in New York by videoconference. The two classes find that the images they receive from each other occasionally freeze for up to 30 seconds before the video continues. This type of problem can most often be solved by
  - (A) increasing bandwidth.
  - (B) upgrading cameras.
  - (C) increasing video resolution.
  - (D) upgrading monitors.
4. Which of the following is the most appropriate format for graphics that are to be embedded within an Internet document?
  - (A) BMP
  - (B) TIFF
  - (C) GIF
  - (D) HTML



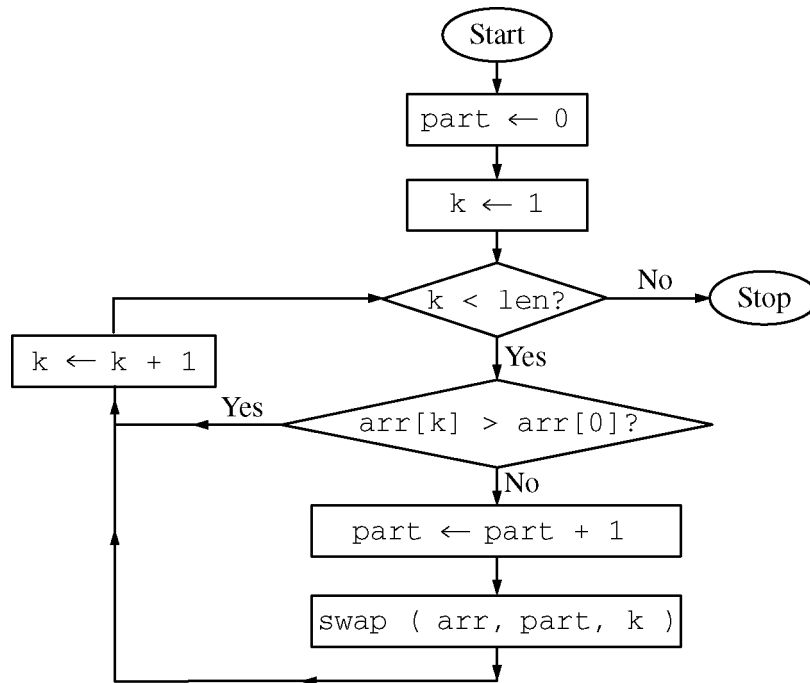
5. Suppose that the class grade for a six-week period is based on 3 tests (T1, T2, T3), each of which counts for 15%, 4 quizzes (Q1, Q2, Q3, Q4), each of which counts for 10%, and a homework notebook (HW), which counts for 15%. The grades are recorded in a spreadsheet similar to the one below.

	A	B	C	D	E	F	G	H	I	J
1	Name	T1	T2	T3	Q1	Q2	Q3	Q4	HW	AVG
2	Jane	87	92	80	76	79	87	74	90	
3	Joe	91	85	77	78	88	96	90	92	
4	Bill	65	72	70	80	81	74	77	80	
5	Brenda	96	88	91	76	91	100	74	98	

Which of the following formulas would NOT be a correct calculation of the six-week weighted average for Jane?

- (A)  $=B2*0.15+C2*0.15+D2*0.15+E2*0.1+F2*0.1+G2*0.1+H2*0.1+I2*0.15$
- (B)  $=(B2+C2+D2+I2)*0.15+(E2+F2+G2+H2)*0.1$
- (C)  $=(B2+C2+D2+I2)*1.5+(E2+F2+G2+H2)/10$
- (D)  $=(B2+C2+D2+I2)/15+(E2+F2+G2+H2)/10$
6. A teacher has assigned students several topics to discuss outside of class using an electronic form of communication. The teacher wants the students' messages to be organized by topic and wants to have all historical messages available to students. To facilitate this type of communication most effectively, the teacher should have students
- (A) participate in a threaded discussion group.
- (B) send e-mail messages with attached document files.
- (C) update pages on the class's website.
- (D) engage in dialogue in a real-time chat room.
7. Which of the following best describes the purpose of generating a flowchart as part of the design of a computer program?
- (A) To test and maintain the efficiency of the overall program
- (B) To present the steps needed to solve the programming problem
- (C) To ensure that all methods are appropriately linked
- (D) To determine the necessary number of global and local variables

8. Consider the following flowchart diagram, where `arr[0..len-1]` is an integer array of length `len`. Assume that the elements `arr[0]`, `arr[1]`, ..., `arr[len-1]` have already been initialized.



Which of the following pseudocode segments implements the algorithm in the flowchart?

- (A) `int part ← 0`  
`int k ← 1`  
**while** ( `k < len` )  
   **if** ( `arr[k] ≤ arr[0]` )  
     `part ← part + 1`  
     `swap ( arr, part, k )`  
   **end if**  
   `k ← k + 1`  
**end while**
- (B) `int part ← 0`  
`int k ← 1`  
**while** ( `k < len` )  
   `k ← k + 1`  
   **if** ( `arr[k] ≤ arr[0]` )  
     `part ← part + 1`  
     `swap ( arr, part, k )`  
   **end if**  
**end while**
- (C) `int part ← 0`  
`int k ← 1`  
**while** ( `k < len` )  
   **if** ( `arr[k] > arr[0]` )  
     `part ← part + 1`  
     `swap ( arr, part, k )`  
   **end if**  
   `k ← k + 1`  
**end while**
- (D) `int part ← 0`  
`int k ← 1`  
**while** ( `k < len` )  
   `k ← k + 1`  
   **if** ( `arr[k] > arr[0]` )  
     `part ← part + 1`  
     `swap ( arr, part, k )`  
   **end if**  
**end while**

9. Which of the following would best facilitate the expansion of a computer program?
- (A) Incorporation of diagrams into the design documents
  - (B) Minimal use of global variables in the source code
  - (C) Construction of methods that are highly dependent on one another
  - (D) Extensive use of functions that support the debugging process
10. A software system is to be developed for which the requirements are well understood and the risk of failure is minimal. To meet these requirements, which of the following software development models would be most appropriate to use?
- (A) Chaos
  - (B) Incremental
  - (C) Spiral
  - (D) Waterfall
11. The most appropriate way to use a library of program code is to access the
- (A) methods or functions by way of the interface.
  - (B) implementation details of the methods or functions.
  - (C) methods or functions by way of the source code.
  - (D) documentation of the methods or functions.
12. Consider the following pseudocode segment with integer variables, where the precondition at the beginning of the segment is missing.
- ```
// missing precondition
x ← x + 1
y ← y + x
// postcondition:
// y == 2 * x
```
- Which of the following would be a valid precondition for the code segment above?
- (A)  $y == x - 1$
  - (B)  $y == x$
  - (C)  $y == x + 1$
  - (D)  $y == x + 2$
13. Which of the following techniques is used by most programming languages to intercept events that disrupt the normal flow of a program's execution?
- (A) Code security
  - (B) Flow control
  - (C) Exception handling
  - (D) Error detection
14. A multibyte data representation is stored in memory with its most significant byte in the lowest memory address. Which of the following describes this method of addressing?
- (A) ASCII
  - (B) Big-endian
  - (C) NUXI ordering
  - (D) Huffman encoding

15. Which of the following is most efficient for manipulating a list that contains integers and is of predefined size?
- (A) A stack
  - (B) A linked list
  - (C) An array
  - (D) A sequential file
16. A binary heap data structure is best represented conceptually using which of the following?
- (A) A binary tree
  - (B) A graph
  - (C) A linked list
  - (D) A stack

17. Consider the following pseudocode procedure `calc`, where the first and second parameters are passed by value and the third and fourth parameters are passed by reference. That is, actual parameters passed to formal parameters `w` and `x` are passed by value, while those passed to formal parameters `y` and `z` are passed by reference.

```

procedure calc ( pass-by-value int w,
                  pass-by-value int x,
                  pass-by-reference int y,
                  pass-by-reference int z )

    w ← w + 1
    x ← x * 2
    y ← y + 3
    z ← z * 4
end procedure

```

What are the values of `a` and `b` at the end of the code fragment below?

```

int a ← 5
int b ← 6
calc ( a, a, b, b )

```

- (A) `a = 5` and `b = 24`
- (B) `a = 5` and `b = 36`
- (C) `a = 10` and `b = 6`
- (D) `a = 12` and `b = 6`

18. Consider a class `Stack` defined with methods `push ( x )`, `pop()`, and `peek()` that implement a stack data structure. (Note that **void** `push ( int x )` pushes the integer `x` onto the top of the stack; **int** `pop()` removes the integer at the top of the stack and returns that integer; **int** `peek()` returns the integer at the top of the stack without removing it from the stack.)

Consider the following pseudocode fragment, where `S` is a `Stack` instance that will hold integers.

```
Stack S ← new Stack()  
S.push ( 4 )  
S.push ( 3 )  
S.push ( S.peek() + S.peek() )  
S.push ( S.pop() * S.pop() )  
print ( S.peek() )
```

What is printed by the last line of code?

- (A) 18
- (B) 21
- (C) 28
- (D) 32

19. Consider the following pseudocode functions, where each **print** statement prints on a separate line of output and then executes a line feed.

```
void f1 ( int n )  
  
    int k ← 0  
  
    do {  
        k ← k + 1  
        print k  
    } while ( k < n )  
  
end f1
```

```
void f2 ( int n )  
  
    int k ← 0  
  
    while ( k < n )  
        k ← k + 1  
        print k  
    end while  
  
end f2
```

Which of the following describes all the values of the input  $n$  for which functions  $f1$  and  $f2$  print the same sequence of numbers?

- (A)  $n > 0$
- (B)  $n \geq 0$
- (C)  $n < 0$
- (D)  $n \leq 0$



20. Consider the following pseudocode fragment, where  $x$  is an integer variable initialized to a nonnegative integer value.

```
// x is a nonnegative integer
int sum
 $x \leftarrow x / 2$  // integer division; truncates fractions
for (  $\text{sum} \leftarrow 1$ ;  $x > 0$ ;  $x \leftarrow x / 2$  )
     $\text{sum} \leftarrow \text{sum} + 1$ 
end for
```

Which of the following will calculate the same value of  $\text{sum}$  as the fragment above?

- |                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(A) <b>int</b> <math>\text{sum} \leftarrow 0</math><br/> <math>x \leftarrow x / 2</math><br/> <b>while</b> ( <math>x \geq 0</math> )<br/>             <math>\text{sum} \leftarrow \text{sum} + 1</math><br/>             <math>x \leftarrow x / 2</math><br/> <b>end while</b></p> | <p>(B) <b>int</b> <math>\text{sum} \leftarrow 1</math><br/> <math>x \leftarrow x / 2</math><br/> <b>while</b> ( <math>x \geq 0</math> )<br/>             <math>\text{sum} \leftarrow \text{sum} + 1</math><br/>             <math>x \leftarrow x / 2</math><br/> <b>end while</b></p> |
| <p>(C) <b>int</b> <math>\text{sum} \leftarrow 0</math><br/> <b>do</b> {<br/>             <math>\text{sum} \leftarrow \text{sum} + 1</math><br/>             <math>x \leftarrow x / 2</math><br/>         } <b>while</b> ( <math>x &gt; 0</math> )</p>                                 | <p>(D) <b>int</b> <math>\text{sum} \leftarrow 1</math><br/> <b>do</b> {<br/>             <math>\text{sum} \leftarrow \text{sum} + 1</math><br/>             <math>x \leftarrow x / 2</math><br/>         } <b>while</b> ( <math>x &gt; 0</math> )</p>                                 |

21. Which of the following represents the average-case performance of a quicksort algorithm?

- (A)  $O(n)$
- (B)  $O(\log_2 n)$
- (C)  $O(n^2)$
- (D)  $O(n \log_2 n)$

22. Consider the following pseudocode function, where each **print** statement prints on a separate line of output and then executes a line feed.

```
void h ( int n )  
    if ( n ≥ 4 )  
        h ( n / 2 )  
    end if  
    print n  
end h
```

What is printed when the call `h ( 16 )` is executed?

- (A) 2  
(B) 16  
(C) 16  
8  
4  
2  
(D) 2  
4  
8  
16
23. A specific sorting algorithm begins by finding the largest element and swapping that element with the last element. Which of the following sorting algorithms fits this description?
- (A) Quicksort  
(B) Insertion sort  
(C) Heapsort  
(D) Selection sort

24. Consider the following pseudocode binary search function, which returns the largest array index  $k$  such that  $a[k] \leq x$ .

```
// precondition 1: integer array a is sorted in
//                  ascending order
// precondition 2:  $0 \leq \text{first} < \text{last} < \text{length of array a}$ 
// precondition 3:  $a[\text{first}] \leq x < a[\text{last}]$ 
int f(int array a, int x, int first, int last)
    while ( first + 1  $\neq$  last )
        int mid  $\leftarrow$  ( first + last ) / 2      // integer division
        if ( x < a[mid] )
            last  $\leftarrow$  mid
        else
            first  $\leftarrow$  mid
        end if
    end while
    return first
end f
```

Consider the following (incomplete) equivalent recursive implementation of function  $f$ .

```
int f(int array a, int x, int first, int last)
    if ( first + 1 == last )
        return first
    end if
    int mid  $\leftarrow$  ( first + last ) / 2
    // missing code block
end f
```

Which of the following could replace the missing code block so that the recursive function will work as intended?

- |                                                                                                                                                                                            |                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(A) <b>if</b> ( <math>x \geq a[\text{mid}]</math> )<br/>             <b>return</b> f(a, x, first, mid)<br/>           <b>end if</b><br/>           <b>return</b> f(a, x, mid, last)</p> | <p>(B) <b>if</b> ( <math>x \geq a[\text{mid}]</math> )<br/>             <b>return</b> f(a, x, mid, first)<br/>           <b>end if</b><br/>           <b>return</b> f(a, x, last, mid)</p> |
| <p>(C) <b>if</b> ( <math>x \geq a[\text{mid}]</math> )<br/>             <b>return</b> f(a, x, mid, last)<br/>           <b>end if</b><br/>           <b>return</b> f(a, x, first, mid)</p> | <p>(D) <b>if</b> ( <math>x \geq a[\text{mid}]</math> )<br/>             <b>return</b> f(a, x, last, mid)<br/>           <b>end if</b><br/>           <b>return</b> f(a, x, mid, first)</p> |

25. Consider the following pseudocode function.

```
// precondition: n and k are nonnegative integers
int f ( int n, int k )
    if ( k * n == 0 )
        return 1
    else
        return f ( n - 1, k - 1 ) + f ( n - 1, k )
    end if
end f
```

What value is returned by the call `f ( 4, 2 )` ?

- (A) 4
- (B) 5
- (C) 7
- (D) 11

## Answers to Sample Questions

| Question Number | Correct Answer |
|-----------------|----------------|
| 1               | B              |
| 2               | C              |
| 3               | A              |
| 4               | C              |
| 5               | D              |
| 6               | A              |
| 7               | B              |
| 8               | A              |
| 9               | B              |
| 10              | D              |
| 11              | A              |
| 12              | C              |
| 13              | C              |
| 14              | B              |
| 15              | C              |
| 16              | A              |
| 17              | B              |
| 18              | A              |
| 19              | A              |
| 20              | C              |
| 21              | D              |
| 22              | D              |
| 23              | D              |
| 24              | C              |
| 25              | D              |

## 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. A helpful resource is the [Strategies for Success video](#), which includes tips for preparing and studying, along with tips for reducing test anxiety.

### 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 "1. Learn About Your Test" on page 5, which outlines the content categories that the test measures and what percentage of the test covers each topic. Visit [www.ets.org/praxis/testprep](http://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](http://www.ets.org/praxis/testprep). Test preparation materials include sample questions and answers with explanations.

### 4) Plan and organize your time.

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

- Choose a test date far enough in the future to leave you plenty of preparation time. Test dates can be found at [www.ets.org/praxis/register/centers\\_dates](http://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 "9. Understand Your Scores" on page 40.

### 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 29 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 29, 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 15.
- **Prepare your presentation for the group.** When it's your turn to present, prepare something that is more than a lecture. Write two or three original questions to pose to the group. Practicing writing actual questions can help you better understand the topics covered on the test as well as the types of questions you will encounter on the test. It will also give other members of the group extra practice at answering questions.



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

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

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

## 5. Develop Your Study Plan

### *Develop a personalized study plan and schedule*

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

#### Use this worksheet to:

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

**Praxis Test Name (Test Code):** Core Academic Skills for Educators: Reading (5712)  
**Test Date:** 9/15/15

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

(continued on next page)

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

**Use this worksheet to:**

- 

**Test Date:** \_\_\_\_\_

[illegible]

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[illegible]

## 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 Series* tests at [http://www.ets.org/s/praxis/pdf/passing\\_scores.pdf](http://www.ets.org/s/praxis/pdf/passing_scores.pdf) or on the Web site of the state for which you are seeking certification/licensure.
6. **Use your energy to take the test, not to get frustrated by it.** Getting frustrated only increases stress and decreases the likelihood that you will do your best. Highly qualified educators and test development professionals, all with backgrounds in teaching, worked diligently to make the test a fair and valid measure of your knowledge and skills. Your state painstakingly reviewed the test before adopting it as a licensure requirement. The best thing to do is concentrate on answering the questions.



## 7. 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 have a disability or other health-related need?

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

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

For more information on these accommodations, visit [www.ets.org/praxis/register/disabilities](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/s/disabilities/pdf/bulletin\\_supplement\\_test\\_takers\\_with\\_disabilities\\_health\\_needs.pdf](http://www.ets.org/s/disabilities/pdf/bulletin_supplement_test_takers_with_disabilities_health_needs.pdf)

You can find additional information on available resources for test takers with disabilities or health-related needs at [www.ets.org/disabilities](http://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 a pen or pencil to use on the scratch paper you are given
- 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](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](http://www.ets.org/praxis/test_day/policies/calculators))
- any electronic, photographic, recording, or listening devices

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

Test centers assume no responsibility for your personal items.

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

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

Visit [http://www.ets.org/s/praxis/pdf/sample\\_score\\_report.pdf](http://www.ets.org/s/praxis/pdf/sample_score_report.pdf) to see a sample score report. To access *Understanding Your Praxis Scores*, a document that provides additional information on how to read your score report, visit [www.ets.org/praxis/scores/understand](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 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.

### 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)
- *The Praxis Series Passing Scores* (PDF), found at [www.ets.org/praxis/scores/understand](http://www.ets.org/praxis/scores/understand)
- 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 the *Praxis* Subject Assessments (formerly the *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](http://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 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.

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

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

### How long will it take to receive my scores?

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

### Can I access my scores on the Web?

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

The process is easy—simply log into My *Praxis* Account at [www.ets.org/praxis](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.

\*ETS Standards for Quality and Fairness (2003, Princeton, NJ) are consistent with the “Standards for Educational and Psychological Testing,” industry standards issued jointly by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (1999, Washington, DC).

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](http://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](http://www.ets.org/praxis/store)



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