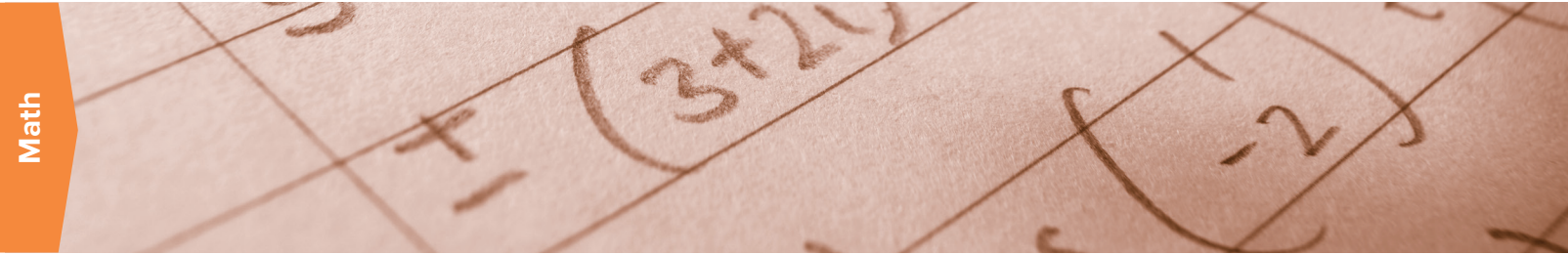


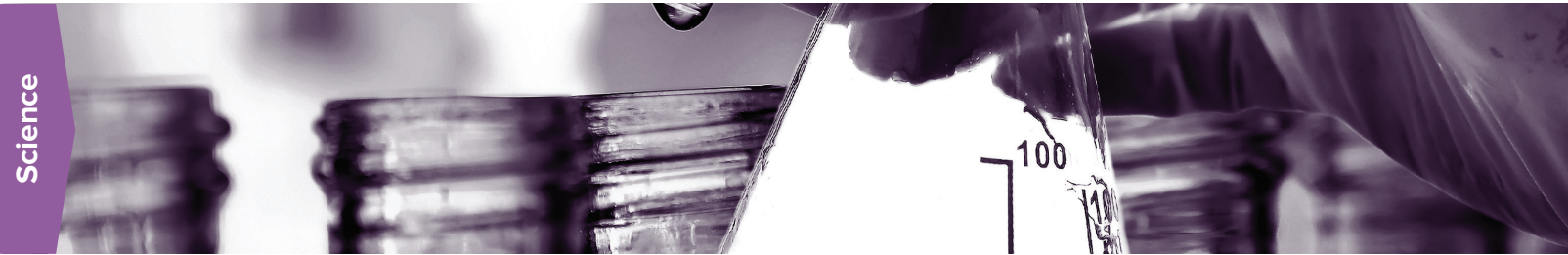
# College and Career Readiness Practice Series



Math



Writing



Science



Reading



Social Studies



Program Sampler

# College and Career Readiness Practice Series

---

---

---

---

---

## Program Sampler



# College and Career Readiness Practice Series

These consumable practice workbooks are a simple, cost-effective way to help adult learners master the skills outlined in the College and Career Readiness Standards—preparing students for high school equivalency test success and a smooth transition to postsecondary education and/or career.

## Each lesson includes:

- 1 A brief explanation of the skill
- 2 Stepped-out and guided examples of the skill
- 3 Independent practice questions

### 2 Comparing and Ordering Rational Numbers

In order to compare rational numbers, you must be able to convert between different forms of numbers. These include fractions and mixed numbers, decimals, and percentages. Here are some examples of equivalent forms of the same number.

$0.08 = \frac{8}{100} = \frac{2}{25}$      $67\% = \frac{67}{100} = 0.67$      $-\frac{3}{8} = -\frac{11}{8} = -1.375$      $1.02 = \frac{102}{100} = 102\%$

To compare two or more rational numbers, change them to the same form. To compare fractions, either convert them to decimals or write them as fractions with the same denominator.

#### Review the Skill

Read the questions and explanations to learn how to find the answers.

**Example 1**  
Order the numbers from least to greatest:  
 $\frac{3}{4}$ , 99%,  $-\frac{44}{53}$ ,  $-1.5$

**Steps to a Solution**

- 1 Start with the big picture: there is only one negative number, so it is least.
- 2 Write the other numbers as decimals and compare.  
 $\frac{3}{4} = 1.75$      $99\% = 0.99$      $-1.5 = 1.5$

First, compare the whole number parts. If the whole number parts are the same, compare the decimal parts.

Correct Answer:  $-\frac{44}{53}$ , 99%,  $-1.5$ ,  $\frac{3}{4}$

**Example 3**  
Which number has the greatest value?

A. 140%                      C.  $-10\frac{1}{2}$   
B.  $\frac{9}{5}$                             D.  $-1.8$

**Guided Solution**  
The greatest value will be the farthest right on the number line. Start by looking at the big picture and see if any choices can be eliminated. Option C is a large negative number so you know it will be the farthest left on the number line. Convert each remaining number to a decimal. To write a percent as a decimal, move the decimal point two places to the left.

Correct Answer: B

**Example 2**  
Write a decimal that is equivalent to  $-8\frac{3}{4}$ .

**Guided Solution**  
Start by converting the mixed fraction to an improper fraction:  
 $-8\frac{3}{4} = -8 + \frac{3}{4} = -\frac{(8 \times 4)}{4} + \frac{3}{4} = -\frac{32}{4} + \frac{3}{4} = -\frac{29}{4}$

Then divide the numerator by the denominator to get the decimal.

Correct Answer:  $-7.25$

**Example 4**  
Mary found a sale that advertised  $\frac{1}{4}$  off the regular price of scarves. What is the percentage off the total price?

**Guided Solution**  
Remember that percent means "parts per 100." Write the fraction as an equivalent fraction with 100 in the denominator:  $\frac{1}{4} \times \frac{25}{25} = \frac{25}{100}$

Correct Answer: 25%

#### Practice the Skill

Answer the following questions. Show your work on a separate sheet of paper.

1. Which number has the least value?  
A.  $-5.7$   
B.  $-\frac{8}{10}$   
C.  $-\frac{5}{100}$   
D.  $-5.85$
2. Fill in each blank with  $<$ ,  $>$ , or  $=$ .  
 $1.334$  \_\_\_\_\_  $1.35$   
 $-1.3$  \_\_\_\_\_  $140\%$   
 $33\%$  \_\_\_\_\_  $-2\frac{1}{2}$   
 $-\frac{2}{3}$  \_\_\_\_\_  $-\frac{3}{4}$
3. A lab technician must arrange samples by the amount of sodium they contain. The samples are listed below.  
Sample A: 1.3 mg  
Sample B:  $1\frac{1}{4}$  mg  
Sample C:  $\frac{7}{5}$  mg  
Sample D:  $1.9 \times 10^2$  mg  
Use the letters to list the samples in order from least to greatest.
4. Use the number line below to graph each of the following values:  $-3\frac{1}{2}$ ,  $\frac{13}{6}$ ,  $-0.85$ .

**Making Connections**  
**Applying Rational Numbers in the Real World**  
Many consumer transactions use percentages and fractions. It is important to be able to compare them to find the best deal possible. For example, if one bank offers  $\frac{1}{4}\%$  interest and another offers 1.05% interest, you must be able to determine which percentage is greater in order to choose the best deal.

Susie and Frank are getting married. They each have accounts with different banks. Susie's bank offers  $3\frac{3}{4}\%$  interest on home equity loans. Frank's bank offers 3.65% interest on the same type of loans. They both think that their bank is offering the better deal. Which bank is actually offering a better rate for the couple?

4 Mathematics: Number Concepts

Mathematics: Number Concepts 5

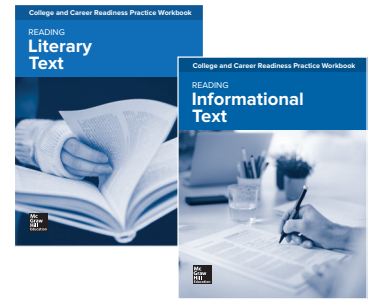
## Other key features include:

- Integrated critical and higher-order thinking skills
- Contextualized practice questions that include workplace, real world, and 21st century skills
- Point-of-use tips to help students fully understand content, answer questions, and avoid common errors
- Item types that reflect the most commonly used types in high school equivalency exams: multiple choice, fill-in-the-blank, graphing, short answer, extended response
- Up to three full pages of practice questions per lesson
- 32-40 pages per consumable workbook
- Content spans a 6-12 grade level equivalent
- All titles available in English and Spanish

## All titles available in convenient 10-packs!

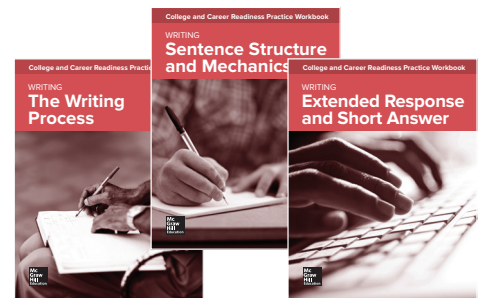
### Reading

Literary Text  
Informational Text



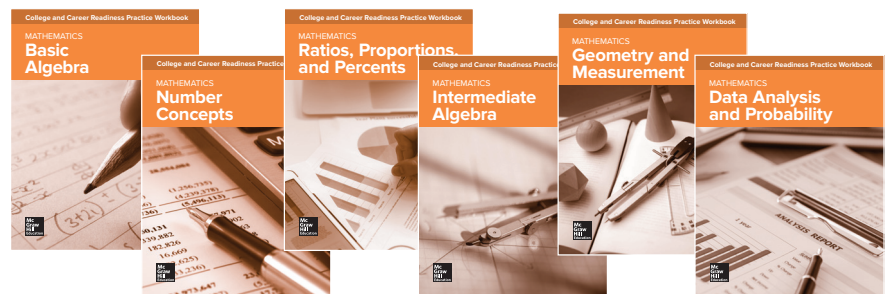
### Writing

The Writing Process  
Sentence Structure and Mechanics  
Extended Response and Short Answer



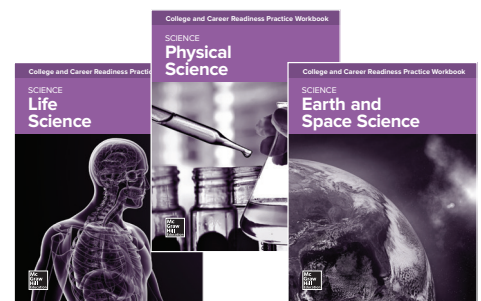
### Mathematics

Basic Algebra  
Number Concepts  
Ratios, Proportions, and Percents  
Intermediate Algebra  
Geometry and Measurement  
Data Analysis and Probability



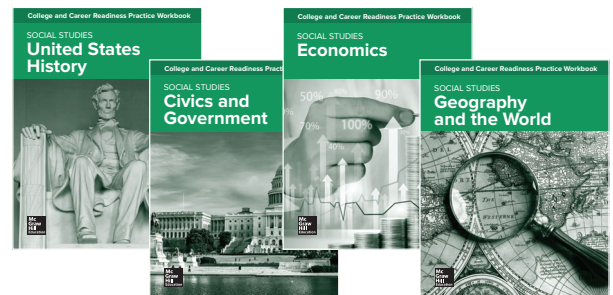
### Science

Life Science  
Physical Science  
Earth and Space Science



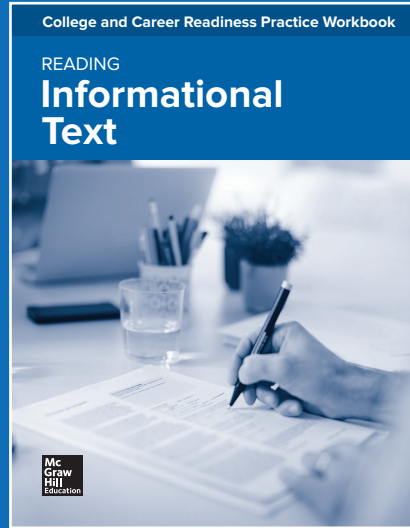
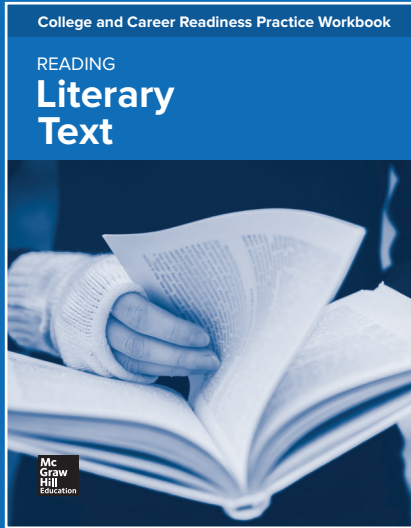
### Social Studies

United States History  
Civics and Government  
Economics  
Geography and the World



# Reading

---



---

### **Informational Text**

- Lesson 1 Determine Main Idea and Cite Supporting Details
- Lesson 2 Summarize Ideas and Analyze Important Details
- Lesson 3 Analyze Relationships Within Text: Compare and Contrast
- Lesson 4 Analyze Relationships Within Text: Cause and Effect
- Lesson 5 Analyze Text Structure
- Lesson 6 Analyze Sequence ♦
- Lesson 7 Understand and Use Multi-Step Instructions
- Lesson 8 Determine Meaning: Technical Terms and Unknown Words
- Lesson 9 Interpret Vocabulary: Denotative, Connotative, and Figurative Meanings
- Lesson 10 Interpret and Apply Written Policies and Procedures

### **Literary Text**

- Lesson 1 Determine Central Ideas and Supporting Details
- Lesson 2 Identify Themes
- Lesson 3 Determine an Author's Purpose and Point of View
- Lesson 4 Analyze Character, Dialogue, and Setting
- Lesson 5 Analyze Plot Events
- Lesson 6 Analyze Relationships Within Text: Compare and Contrast
- Lesson 7 Analyze Relationships Within Text: Cause and Effect
- Lesson 8 Make Inferences and Draw Conclusions
- Lesson 9 Interpret Language: Word Choice, Meaning, Tone, and Imagery ♦

## Interpret Language: Word Choice, Meaning, Tone, and Imagery

Authors choose their words carefully to create images in their readers' minds. When authors write the details of a story or poem, the words and phrases they choose also help set the tone. The **tone** expresses the author's attitude about the subject. An author can also set the tone and mood of a text by using connotative and figurative language. The **mood** is the emotion that the reader feels when reading the text.

The **connotative** meaning of a word or phrase is the meaning or feeling suggested by the word. **Figurative language** is language that implies more than its literal meaning. As you read, look closely at the words and phrases the author chose to identify the text's tone and mood. Think about whether the words have a positive or negative meaning and how the words make you feel.

### Review the Skill

Read the passage. Then read the example questions and explanations to learn how to find the answers.

#### A Birthday

by Christina Rossetti

1. My heart is like a singing bird  
Whose nest is in a watered shoot;  
My heart is like an apple-tree  
Whose boughs are bent with thick-set fruit;
5. My heart is like a rainbow shell  
That paddles in a halcyon sea;  
My heart is gladder than all these  
Because my love is come to me.

- Raise me a dais of silk and down;
10. Hang it with vair and purple dyes;  
Carve it in doves and pomegranates,  
And peacocks with a hundred eyes;  
Work it in gold and silver grapes,  
In leaves and silver fleurs-de-lys;
  15. Because the birthday of my life  
Is come, my love is come to me.

#### Figurative Language

To interpret similes, remember these ideas:

- Similes compare two unlike things.
- Similes use the words *like* or *as* in the comparison.
- Example: *John is as strong as an ox.*

To interpret metaphors, remember these ideas:

- Metaphors compare two unlike things.
- Metaphors connect unrelated subjects. They do not use *like* or *as*.
- Example: *The dancers' feet were tiny clouds floating across the floor.*

#### Example Question 1

Which of the following words best describes the poet's feelings?

- |             |            |
|-------------|------------|
| A. mournful | C. joyful  |
| B. calm     | D. nervous |

#### Steps to a Solution

The question is asking you to identify the poet's feelings, which is the tone of the poem.

- ① Read the poem. Ask yourself: "What emotions do the author's words convey?"
- ② The poet used words with positive connotations, such as "rainbow shell" and "gladder than," which suggest happiness.
- ③ Read the answer choices. Which of the options is a word that means "happy"?

**Correct Answer:** Option C; *joyful* means "happy"

#### Example Question 2

Which of the following similes best matches the other similes in stanza 1?

- A. My heart is like a sunken ship.
- B. My heart is like a laughing child.
- C. My heart is like a dark, gray cloud.
- D. My heart is like a mighty oak.

#### Guided Solution

The similes in stanza 1 compare the poet's heart to a singing bird and an apple tree. The imagery in these words has a positive connotation, or feeling. Which of the answer options has positive imagery that best relates to a happy heart?

**Correct Answer:** Option B; The image of a laughing child has a positive connotation.

## Practice the Skill

Read the passage. Then answer the questions that follow.

► **As you read...** Connotative and figurative language add depth to literary texts. As you read, reflect on the author's reason for using certain words and phrases. What do the descriptions and word choices tell you about the author's attitude on the subject? How do the words influence how you, or other readers, might feel about the topic of the writing?

### Sunrise

by Charles Erskine Scott Wood

1. The lean coyote, prowler of the night,  
Slips to his rocky fastnesses,  
Jack-rabbits noiselessly shuttle among the sage-brush,  
And from the castellated cliffs,
5. Rock-ravens launch their proud black sails upon the day.  
The wild horses troop back to their pastures.

The poplar-trees watch beside the irrigation-ditches  
Orioles, whose nests sway in the cotton-wood trees by the ditch-side, begin to twitter.  
All shy things, breathless, watch

10. The thin white skirts of dawn,  
The dancer of the sky  
Who trips daintily down the mountain-side  
Emptying her crystal chalice. . . .  
And a red-bird, dipped in sunrise, cracks from a poplar's top
15. His exultant whip above a silver world.

1. What is the mood of the poem?

- A. haunting
- B. sad
- C. indifferent
- D. eager

2. What is the tone of the poem?

- A. frantic
- B. appreciative
- C. determined
- D. distressed

3. Which phrase from the poem is an example of figurative language?

- A. "wild horses troop back to their pastures"
- B. "And from the castellated cliffs,"
- C. "nests sway in the cotton-wood trees"
- D. "thin white skirts of dawn,"

4. Which phrase appeals **most** to the sense of sight?

- A. "prowler of the night"
- B. "begin to twitter"
- C. "a red-bird, dipped in sunrise"
- D. "cracks from a poplar's top"

5. In line 5, the "proud black sails" represent

\_\_\_\_\_

6. What metaphor does the speaker use to describe the dawn in lines 11–12?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Practice the Skill

Read the passage. Then answer the questions that follow.

### The Shore

Jana parked her jalopy in the already-crowded lot and eagerly jumped out. She tugged her chair and beach bag from the trunk and took off like Marco Polo on his first expedition to China. But, unlike Marco Polo, Jana was not going from Italy to China. She was going from Philadelphia to Wildwood, New Jersey, for the first time. At long last, she was going to The Shore, the wondrous, almost mythical, larger-than-life Shore. Jana had been waiting an eternity for this indulgence and was so excited that her stomach felt like a kaleidoscope of butterflies. Even so, with the chair wedged under her right arm and the bulky beach bag bouncing against her hip in time with her steps, the four-block slog felt like a journey to the farthest reaches of Earth.

Jana didn't hit her stride until the second corner, when she first smelled the water. Her body was a huge sponge, greedily soaking in the salty, humid air. She crested a rise and could see the beach in front of her, studded with sunbathers. The breeze greeted her skin with its tiny granules of salt and sand. She became aware of a growing symphony — the wondrous crashing of the waves mixed with the cacophony of sound from sunbathers' voices, loud radios, and vendors hawking their wares. Hurriedly, she removed her sandals and plunged up to her ankles into the warm, pillow-soft sand. For a moment, Jana just stood there, reveling in her first impressions of The Shore. Then, suddenly, she let her gear fall to the sand and bounded like an excited puppy toward the sea.

#### Tone and Word Choice

Tone plays an important role in literary writing. It can help build suspense in a mystery or create a sense of urgency in an adventure. The tone an author conveys in a text is much like the tone of your voice when you speak. The tone of a literary piece should fit the author's purpose for writing, the topic, and the genre.

In their writing, authors convey tone through word choice and sentence structure. An author's word choice can also determine the mood and impact of a text. Readers or listeners can gain a deeper understanding of what an author wants them to feel, think, and understand by analyzing the author's word choices.

- What is the tone of this passage?
 

A. expectant	C. anxious
B. contemplative	D. melancholy
- How does the tone of the passage change if the words *greedily* and *hurriedly* are replaced with *lazily* and *calmly*?
   
\_\_\_\_\_
   
\_\_\_\_\_
   
\_\_\_\_\_

- Which of the following sentences from the first paragraph of the passage contains a simile?
 

A. sentence 1	C. sentence 4
B. sentence 2	D. sentence 5
- The phrase “her stomach felt like a kaleidoscope of butterflies” in paragraph 1 is an example of \_\_\_\_\_ language.
- In paragraph 2 the sentence \_\_\_\_\_  
\_\_\_\_\_ is a metaphor that conveys the way Jana's body and senses react as she approaches the beach.
- The word *eternity* is used in this passage in a way other than its literal meaning. Explain the meaning of *eternity* as it is used in this passage.
   
\_\_\_\_\_
   
\_\_\_\_\_
- Which of the following words, as they are used in the story, has a negative connotation?
 

A. greedily	C. slog
B. wondrous	D. bounded

14. Which word **best** describes Jana’s attitude about the trip?

- A. indulgent
- B. enthusiastic
- C. ambitious
- D. discordant

15. The language used by the author to describe a visit to a beach has mostly a \_\_\_\_\_ connotation.

16. What is the meaning of the word *symphony* as it is used in this passage?

---

---

---

Read the passage. Then answer the questions that follow.

### Inspiration Strikes

The blank canvas stared angrily at Sonam from across the room. He gazed outside gloomily, wishing for a better view than the bricked-over window in the abandoned building across the street. Fed up, Sonam set down his brushes and grabbed his jacket and gloves. Perhaps a change in scenery might give him inspiration, something to spark new ideas for his painting. Moments later, Sonam stepped outside, and the harsh winter wind slapped him across the face. Immediately, his eyes started tearing up, and his nose began to run. Turning around, he raced inside to avoid the biting gusts. Sonam began to wish he was at home reading a book in front of the flames dancing in the fireplace, instead of shivering in the cold, damp studio.

17. What is the mood of this passage?

- A. happy
- B. apathetic
- C. depressed
- D. excited

18. Identify one of the examples of figurative language from the passage and explain what it means.

---

---

---

19. Many of the words in the passage have a \_\_\_\_\_ connotation as they are used in this story.

### Extended Response

*Write your response on a separate piece of paper.*

How does the word choice and imagery used in “Inspiration Strikes” support the author’s purpose? Explain, with examples, the type of language the author uses. How does this compare to the word choice and imagery used in “The Shore”?

### Making Connections

#### Tone and Word Choice in Workplace Communication

Knowing the tone that is appropriate to use in workplace communication, such as e-mail messages, memos, and other workplace documents, is essential to becoming a successful professional. For example, jokes, innuendo, and even some figurative language may not translate well through e-mail messages. Choosing your words carefully and thinking about how your audience may interpret your words or your tone is an important skill to master in the workplace.

Practice this skill by writing two versions of an e-mail message about an upcoming doctor’s appointment. Write one to a supervisor at your workplace requesting permission to leave early for a medical appointment, and write a second message to a friend explaining that you cannot meet for lunch because of the appointment. How does the tone differ between the two messages?

To fully comprehend explanatory and procedural texts, readers need to understand the order of events or steps. Events that happen in **sequence**, or in time order, are also described as occurring in **chronological** order. When reading a passage, look for transitions, and use text features to help determine the sequence of events.

- **Transition words** such as *first*, *next*, *then*, *following*, *after*, and *finally* can refer to the order of events in a text or steps in a procedure.
- Numbered or sequential **lists** can indicate a sequence of steps.
- **Text features** such as titles, headings, or bullets can also help you see how a text is organized and understand the order of events or actions.

When texts do not use clear transition words in describing a procedure or process, you can usually assume that the steps are being presented in chronological, or time, order.

## Review the Skill

Read the passage. Then read the example questions and explanations to learn how to find the answers.

### Memo

**To: All New LPNs**

**Re: First Day**

Welcome to our clinic! As a licensed practical nurse (LPN), you will perform specific tasks to greet a patient for his or her scheduled appointment. First, walk the patient into the exam room. Measure the patient’s weight and height. Then take the patient’s temperature and blood pressure. Take the patient’s pulse. Record all of this information in the patient’s chart.

Ask the patient about any medications he or she is taking, and record the name of each medication in the patient’s chart. For most appointments, you will inform the patient that the doctor will be there shortly and then exit the exam room. However, depending on the nature of the appointment, the doctor may ask you to draw blood for a blood test.

### Example Question 1

As a LPN, what is the last piece of information you should record on a patient’s chart before informing the patient that the doctor will arrive shortly?

- A. pulse
- B. weight and height
- C. current medications
- D. blood pressure

#### Steps to a Solution

The question is asking you to identify a specific step in the procedure. The steps are not numbered, but they are written in the order that they should occur.

- 1 Read the passage.
- 2 Look for the last instruction that references writing in the patient’s chart.
- 3 Find the answer choice that appears in that location in the passage.

**Correct Answer:** Option C; Medications are the last thing mentioned that should be referenced in the patient’s chart.

### Example Question 2

Which description best explains how this text is arranged?

- A. One process described in order of importance.
- B. One process described in reverse chronological order.
- C. Two processes described in order of importance.
- D. One process described in chronological order.

#### Guided Solution

Only one process is described in this passage (how LPNs should care for patients), which eliminates Option C. While all steps in this procedure are important, the word *first* gives us the clue that the instructions are written in the order they should be performed, or chronologically. The word “reverse” in Option B is the opposite of chronological order.

**Correct Answer:** Option D; This passage describes one process and is written in chronological order.

## Practice the Skill

Read the passage. Then answer the questions that follow.

► **As you read...** When reading a procedure, “if-then” statements can provide clues to help you better understand various instructions. They tell you that for a certain situation (“if”), you should take a specific course of action (“then”).

### Standard Procedures in Response to a 911 Medical Emergency

As a member of an ambulance team, an emergency medical technician (EMT) needs to quickly react and assess the situation in order to provide competent, accurate care to patients. To do so, the following procedures should be followed at all times:

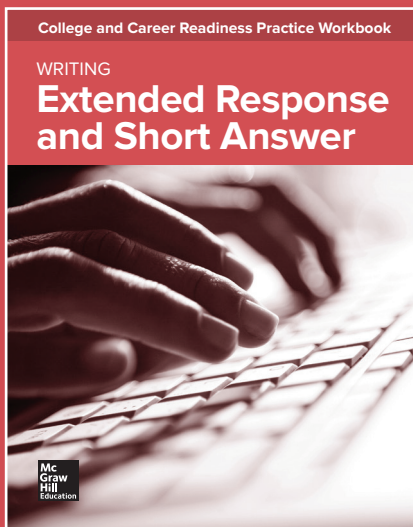
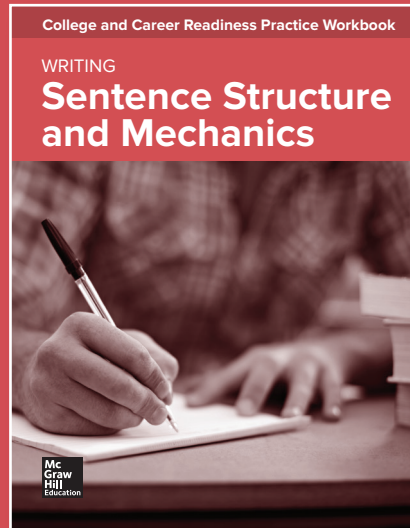
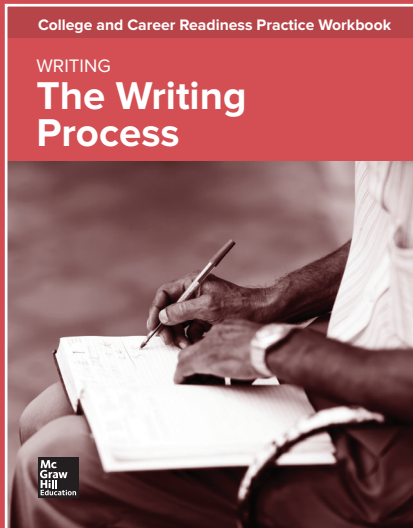
1. Upon arrival at the scene, assess the patient’s condition.
2. If the condition is life-threatening, conduct appropriate procedures. These include, but are not limited to, techniques to open the airway if the patient is not breathing. If a tracheotomy is needed, only a licensed EMT may perform it. Restart the heartbeat if it is absent, either manually or with paddles (the latter should only be done by a licensed EMT). Stop severe bleeding using appropriate procedures and materials. Suspected heart attack or stroke requires immediate hospitalization.
3. If the patient’s condition is critical, prepare the patient for transport to the hospital. Immobilize the head if there is a suspected brain injury.
4. If the patient’s condition is not critical, take a medical history, including medications taken and the circumstances of the emergency. Treat minor injuries. Patients treated for minor injuries may remain in the home unless transport to the hospital is requested.
5. Prior to transport, immobilize the patient on a backboard. Place the backboard on a stretcher, and make sure the patient is well-secured. Carry the patient to the ambulance. If the patient’s condition is life-threatening, the EMT with the most advanced license should remain with and monitor the patient, while the other EMT drives to the hospital.
6. At the hospital, transfer the patient to the emergency room. Provide the ER doctors with the written record made of the patient’s condition and treatment so far. Speak with the doctors to convey important details not on the written record.
7. Check ambulance supplies and restock low supplies.

1. You are a licensed EMT whose current patient is at home and not breathing. What is your next step after assessing the patient’s condition?
  - A. Take the patient to the hospital immediately.
  - B. Open the airway; perform a tracheotomy if needed.
  - C. Get a medical history and treat injuries.
  - D. Restart the patient’s heartbeat.
2. Your next patient is conscious and bleeding. You stop the bleeding and determine the patient is not critical. What do you do next?
  - A. Treat minor injuries.
  - B. Prepare the patient for transport.
  - C. Take a medical history.
  - D. Stitch the wound.

3. If you suspect a brain injury, then you should \_\_\_\_\_ the patient’s \_\_\_\_\_ prior to transport.
4. Before transporting a patient, he or she should be well-secured on a(n) \_\_\_\_\_.
5. You have arrived at the hospital with your patient. What are your next three steps?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Writing

---



---

## The Writing Process

- Lesson 1 Paragraph Structure
- Lesson 2 Tone and Diction ♦
- Lesson 3 Organization: Order of Importance and Sequence.
- Lesson 4 Organization: Cause and Effect and Compare and Contrast
- Lesson 5 Organization: Descriptions and Problem with Solutions
- Lesson 6 Prewriting
- Lesson 7 Writing
- Lesson 8 Revising and Editing

## Sentence Structure and Mechanics

- Lesson 1 Pronoun Antecedents ♦
- Lesson 2 Subject-Verb Agreement
- Lesson 3 Spelling
- Lesson 4 Modifiers
- Lesson 5 Parallel Structure
- Lesson 6 Phrases
- Lesson 7 Clauses: Independent and Dependent
- Lesson 8 Phrases and Clauses with Punctuation

## Extended Response and Short Answer

- Lesson 1 Define Narrative Text
- Lesson 2 Persuasive Text: Write an Introduction
- Lesson 3 Persuasive Text: Write Supporting Paragraphs.
- Lesson 4 Persuasive Text: Write a Conclusion ♦
- Lesson 5 Write a Persuasive Essay
- Lesson 6 Revise and Edit a Persuasive Essay
- Lesson 7 Informative Essay: Select a Topic
- Lesson 8 Informative Essay: Write an Introduction
- Lesson 9 Informative Essay: Organize Supporting Paragraphs
- Lesson 10 Informative Essay: Write a Conclusion
- Lesson 11 Write an Informative Essay
- Lesson 12 Revise and Edit an Informative Essay.

Your choice of words affects how readers respond to your writing. Therefore, it is important to choose effective words to help readers understand and acknowledge your point of view.

- **Diction** is the type of vocabulary you use. One example of an author’s diction is the use of formal or informal words, such as *I facilitate the engagement between students* versus *I help students communicate*.
- **Tone** is the attitude or feeling toward your topic. An author’s tone might be appreciative, angry, cold, or sympathetic, to name a few.

Each time you write, make sure you use effective diction and an appropriate tone for your purpose. For example, when you respond to an e-mail message about a job opportunity, you will probably want to use formal diction and a professional tone. When you write an e-mail message to a friend, you will likely use less formal sentences that reflect a conversational, warm, and friendly tone.

## Review the Skill

Read the letter. Then read the questions and explanations to learn how to find the answers.

### Letter

Dear Josh Lee,

I enjoyed hearing about your upcoming fundraiser at the charity meeting last week. I am writing to inquire about volunteer opportunities at the event. I am available from 10 a.m. to 4 p.m. on September 9. Please respond if you could use assistance at that time. I would appreciate the chance to participate in the fundraiser.

Sincerely,  
Serena Houston

### Example Question 1

Which of the following most likely describes how the letter writer knows Josh Lee?

- A. They are friends who see each other often.
- B. They are acquaintances who respect each other.
- C. They are professionals who have worked together.
- D. They are neighbors who have volunteered together.

#### Steps to a Solution

The question is about the relationship between the writer of the letter and the person she is addressing.

- 1 Reread the letter and note the writer’s purpose.
- 2 Pay attention to the words she uses, such as “inquire,” “upcoming,” and “assistance.” What kind of tone and diction is the writer using?
- 3 Review the four answer options. Which best describes whom the author would most likely address in this way?

**Correct Answer:** Option B; The courteous word choice plus the use of a first and last name indicate this is a more formal, business letter.

### Example Question 2

Rewrite sentence 4 of the letter using a more familiar tone and word choice.

---



---



---

#### Guided Solution

Reread sentence 4, and determine the author’s purpose. Think of other words she could use to express the same ideas. Make sure to choose synonyms and expressions that you might use when talking with a friend. Then summarize the sentence in your own words.

**Possible Answer:** *Tell me if you need help;* Using everyday language makes the sentence less formal.

## Practice the Skill

Read the passage. Then answer the questions that follow.

### Small Business Institute: Day 1

Welcome to your first day of orientation. When you arrive, take a few minutes to say hello to your fellow entrepreneurs. We know that the first few days of a new program can be difficult, and we are here to help!

Our summer business institute was founded in 1994. Its mission is to help people of all ages navigate the process of opening a restaurant or starting any new small business. Since the institute was designed especially to help local businesses, it is open to city residents only. If you have not already done so, please show your proof of residency to complete your registration.

Today, we'll begin by introducing you to mentors from a variety of industries. They will speak about their experiences and later this week you will have the opportunity to talk with them, one-on-one, about how to achieve your goals.

#### Clues to Formal and Informal Writing

There are certain clues that tell you whether writing is formal or informal. For example, **informal writing** often uses brief forms of writing. Like in text messages, writers use abbreviations and even symbols to express a message. Informal and casual writing is often used among people who know each other well. **Formal writing** includes words that are written out with full sentences and punctuation. Business letters, résumés, and job applications are all examples of formal writing. Another clue to formal writing would include using specialized vocabulary related to the topic. A medical report would have terms related to results of tests, symptoms, and treatments. A résumé would include vocabulary related to the skills of a position. For example, if someone is applying for a job repairing cars, words such as *diagnostic skills using scopes* may be used.

1. How would you describe the author's tone in paragraph 1? Use an example to explain.

2. Which words in paragraph 2 are clues that the author uses more formal language than in the other two paragraphs?

3. Read the final sentence of paragraph 3. Which is a more formal way to say "talk with them, one-on-one"?

- A. chat with you in person
- B. catch up about your needs
- C. get together for a quick meeting
- D. discuss matters with you individually

4. What kind of tone do the words "how to achieve your goals" help create?

- A. joyous
- B. hopeful
- C. solemn
- D. reflective

### Making Connections

#### Writing a Complaint Letter

Writing is an effective tool to use when trying to solve a problem because you have time to develop your ideas, and approach the situation calmly and clearly. Many people use e-mail messages to resolve minor conflicts and misunderstandings. Letters to the editor in magazines and newspapers often point out mistakes that are published. If you receive bad service or something you purchased does not work, you can write a complaint letter to the company describing your experience and how you would like them to fix the problem. In this specific situation it is important to keep the right tone. You want to be clear about why you are unhappy, but you also want to keep the tone professional. Writing an angry letter may not get you the results you want, such as a free dinner or a replacement for an object that broke.

Imagine you ordered a new tablet that was on sale online. When the box arrives, the box is clearly damaged, and inside, the tablet screen is cracked. Write a complaint letter to the delivery service explaining the problem and how you would like the problem fixed.



## Pronoun Antecedents

The **noun** is one part of speech. A noun names a person, place, thing, or idea. Examples of nouns include *George Washington*, *United States*, *treaty*, and *liberty*. Another part of speech is the **pronoun**. A pronoun can replace or refer to a noun. For example, instead of using the noun *George Washington*, you could use the pronoun *he*.

When using pronouns, make sure that each pronoun agrees with its **antecedent**—the noun that it replaces. The antecedent always comes before the pronoun, so the pronoun must agree with its antecedent in 3 ways:

- **Number:** Singular pronouns, such as *it*, *she*, and *that*, refer to just one person, place, thing, or idea. Plural pronouns, such as *both*, *they*, and *these*, refer to more than one person, place, thing, or idea. The pronouns *everybody*, *everyone*, *everything*, *no one*, and *anybody* are singular.
- **Gender:** The pronouns *she* and *her* replace nouns for women and girls. The pronouns *he* and *him* replace nouns for men and boys.
- **Person:** First-person pronouns, which include *I* or *us*, refer to the speaker or writer. Second-person pronouns, such as *you* and *your*, refer to one or more readers or listeners. Third-person pronouns, which include *he*, *their*, and *them*, refer to another person or group of people.

### Review the Skill

Read the passage. Then read the questions and supporting material to learn how to find the answers.

#### E-mail message

**From:** Edward Laci

**To:** info@irelandtechco.com

**Subject:** Some questions

To whom it may concern,

(1) I am thinking about purchasing some of your software programs for my office. (2) However, I have a few questions. (3) First, how much do they cost? (4) Do you provide discounts for large orders? (5) I would need to purchase the programs for approximately 50 workers. (6) Finally, I am especially interested in your newest graphic arts program. (7) What computer systems are required to use them? (8) Thank you for your assistance.

#### Example Question 1

What is the antecedent of the pronoun “they” in the third sentence of this passage?

- |                     |                             |
|---------------------|-----------------------------|
| <b>A.</b> questions | <b>C.</b> large orders      |
| <b>B.</b> discounts | <b>D.</b> software programs |

#### Steps to a Solution

Recall that “they” is a plural pronoun.

- 1 Reread the third sentence.
- 2 Reread the first and second sentences to identify plural nouns that “they” could refer to.
- 3 Select the plural noun that makes the most sense.

**Correct Answer:** Option D; *They* in “how much do they cost” refers to software programs.

#### Example Question 2

Which sentence in the passage includes a pronoun that does not agree with its antecedent?

- |                      |                      |
|----------------------|----------------------|
| <b>A.</b> sentence 3 | <b>C.</b> sentence 7 |
| <b>B.</b> sentence 4 | <b>D.</b> sentence 8 |

#### Guided Solution

Locate the pronouns in each sentence. Then review the passage, and find the antecedent for each pronoun. Remember that pronouns must agree with their antecedents based on number, gender, and person.

**Correct Answer:** Option C; In “required to use them” *them* refers to the graphic arts program. The pronoun should be singular to match the noun *graphic arts program*.

## Practice the Skill

Read the passage. Then answer the questions that follow.

### Camping Checklist for Diane, Sasha, and Me

- Three tents
- Three sleeping bags
- Several flashlights
- Hiking boots for me
- Food for everyone
- Compasses for both Diane and Sasha (They can't find theirs.)
- Maps of the campground for them
- Bottles of water for everyone
- Her cooler
- A first-aid kit

1. Which word in the checklist is a first-person pronoun?

- A. me
- B. Sasha
- C. her
- D. them

2. This first-person pronoun refers to

\_\_\_\_\_.

3. Some pronouns indicate that a person owns (or people own) something. In the checklist,

the pronouns \_\_\_\_\_ and

\_\_\_\_\_ show what certain people own.

4. Which of the following is an antecedent for "They" in the sixth bullet point?

- A. Food
- B. Compasses
- C. Hiking boots
- D. Diane and Sasha

5. Why might the pronoun "her" in the second to last bullet point cause confusion?

\_\_\_\_\_

6. Of the following options, which could replace the name of this list?

- A. Their Camping Checklist
- B. Our Camping Checklist
- C. Her Camping Checklist
- D. Them Camping Checklist

### Extended Response

*Write your response on a separate piece of paper.*

How does the use of pronouns make the list easier to read? Use examples to explain your answer.

## Practice the Skill

Read the passage. Then answer the questions that follow.

► **As you read...** Recognize different types of pronouns. *I, he, she,* and *they* are **subject pronouns**. These pronouns may be the subject of a sentence. *Me, him, her,* and *them* are **object pronouns**. These pronouns may be the object of a verb or a preposition. In the sentence “I talked to him at the park,” *I* is a subject pronoun and *him* is an object pronoun.

### Nikki Giovanni: A Brief Biography

The writer Nikki Giovanni was born in Knoxville, Tennessee, in 1943. Although they moved to Ohio, Giovanni returned to Tennessee in 1960 to attend Nashville’s Fisk University. She studied art and helped edit the school’s literary magazine.

In the 1960s, Giovanni became a professional poet. Over the years, she has published various poetry collections, including *Blues: For All The Changes* and *Bicycles: Love Poems*. These have earned Giovanni numerous awards. She has also received honorary degrees from several universities. Different magazines have named \_\_\_\_\_ “Woman of the Year.”

Today, Giovanni continues to write poetry. She also teaches classes at Virginia Tech.

7. In paragraph 1, which pronoun does not agree with its antecedent?

\_\_\_\_\_

8. Why is this pronoun incorrect?

\_\_\_\_\_  
\_\_\_\_\_

9. Which pronoun should be used instead?

- |              |        |
|--------------|--------|
| A. everybody | C. she |
| B. her       | D. I   |

10. Reread the third sentence in paragraph 2. What is the pronoun in this sentence?

\_\_\_\_\_

11. Which noun is the antecedent of this pronoun?

- |           |                |
|-----------|----------------|
| A. years  | C. collections |
| B. awards | D. magazines   |

12. The pronoun missing from the final sentence of paragraph 2 is

- A. they
- B. her
- C. she
- D. our

13. Reread the last sentences in the passage: “Today, Giovanni continues to write poetry. She also teaches classes at Virginia Tech.” Does this sentence use a second-person pronoun or a third-person pronoun?

\_\_\_\_\_  
\_\_\_\_\_

14. Think about how the passage would change if Nikki Giovanni was writing about herself. How would she rewrite the final sentence?

\_\_\_\_\_  
\_\_\_\_\_

## A Letter

Dear Ramón,

I hope that you had a wonderful summer. I certainly did! My favorite part was when my parents and I stayed in the town of Atlantic Beach, North Carolina, for a few days.

One day, we went swimming in the ocean. Talk about relaxing! The water was warm and fairly calm. We even saw some porpoises swim by in the waves. They really seemed to enjoy themselves.

Another fun thing that he did was visit the nearby town of Beaufort. While we were there, we ate a delicious dinner at a cozy restaurant. It was located near the water, so the view was beautiful. Afterward, we visited a historic site called Fort Macon. I learned a lot of things there, especially about the Civil War.

Anyway, I hope that you write back soon and tell me what is new. My parents say hello. Say hi to both your parents and your brother for me.

Sincerely,

John

### Proper and Common Nouns

Pronouns can replace or rename both **proper nouns** and **common nouns**. A proper noun refers to a specific person, group, or place, such as *Chicago*. Proper nouns should always be capitalized. A common noun is a more general word for a person, place, thing, or idea, such as *city*. Common nouns are only capitalized if they appear at the beginning of a sentence.

15. Identify one proper noun in paragraph 1 of John's letter. Explain why it is a proper noun.

---

---

---

16. Which noun is the antecedent of "they" in paragraph 2?

---

17. What other pronoun in this paragraph also refers to the noun in the question above?

---

18. Explain why the first sentence in paragraph 3 is incorrect.

---

---

19. Rewrite the first sentence of paragraph 3 correctly.

---

---

20. The pronoun "it" in paragraph 3 refers to

- A. the view
- B. the town
- C. the dinner
- D. the restaurant

21. Which of the following is the antecedent of "you" in the last paragraph?

- A. John
- B. Ramón
- C. John's parents
- D. Ramón's brother

## Persuasive Text: Write a Conclusion

The end of a persuasive text is the **conclusion**. The two goals of effective conclusion writing are to restate the author’s claim, or main argument, and to summarize the most important evidence. A strong conclusion can help convince readers to agree with the author’s point of view.

- A conclusion should contain important keywords and ideas from earlier in the text. However, it should not simply repeat information.
- Sometimes, good conclusions describe the positive effects of adopting the author’s point of view or taking a specific action.

In an essay, the conclusion should be one paragraph long. In a shorter piece of writing, the conclusion may be only a sentence or two.

### Review the Skill

Read the introductory paragraph from a persuasive essay. Then read the questions and supporting material to learn how to find the answers.

#### Supporting Local Businesses

In many different communities across the country, large national chain restaurants and stores are commonplace. These national chains may provide good services, but they do not have the unique character of many smaller local businesses. It’s important to preserve local character in our towns and cities. For this reason, people should support locally owned businesses.

#### Example Question 1

How will the conclusion of the essay most likely relate to the sample introduction shown?

- A. It will introduce new ideas about local and national businesses.
- B. It will state a different claim about local and national businesses.
- C. It will restate the idea that readers should support local businesses.
- D. It will add evidence to convince readers to shop at local businesses.

#### Steps to a Solution

The question is asking you to connect the relationship between the essay introduction and conclusion.

- 1 Read the paragraph and determine the main claim.
- 2 Think about the purpose of conclusions: how does it relate to the main claim?
- 3 Choose the option that best matches this purpose.

**Correct Answer:** Option C. Conclusions restate claims in different words and do not introduce new information.

#### Example Question 2

Write a conclusion for this sample introduction in your own words.

#### Guided Solution

In a conclusion, it’s important to emphasize and refer back to your claim. Using different words adds variety and reduces repetition. Reread the author’s original claim. Try using a new sentence structure to vary the word order.

**Possible Answer:** People should buy goods from local businesses because these places give individuality to towns and cities.

#### Cohesive Language

It is important to link your ideas. Pronouns create cohesion, or connections, between your sentences, and add variety. An author might use the phrase *music education programs* in one sentence and *these programs* in the next. The phrase *these programs* connects the ideas in the two sentences. When writing more than one connected sentence, such as a paragraph or essay, review your work to make sure your verb tenses and subject-verb agreement are consistent throughout your writing.

## Practice the Skill

Read the passage. Then answer the questions that follow.

### Music Education for Our Nation's Children

Learning about music is a key part of our children's education. Music education programs teach students not only to play instruments but also to develop other important skills. These skills can help children succeed in other classes, in college, and in the workforce. However, many music classes are threatened by school budget cuts. These programs have many benefits for our children and communities, and we should continue to support their musical education.

Perhaps the most important benefit for children is that music classes support language skills. For instance, studies have shown that just listening to music can help young children develop their vocabulary knowledge. Learning to play an instrument adds even more benefits for children's language skills. Scientists think this is an effect of how our brains work; musical training and vocabulary development occur in the same part of the brain. Because musical training develops this part of the brain, it can also help children build vocabulary skills.

The second most significant benefit of music education is its impact on students' test scores. One study of standardized test results showed that students in schools with high-quality music programs scored 22% higher in language arts and 20% higher in mathematics than students in schools with low-quality music programs. Another study showed that students taking music courses had higher scores on their SATs than students who did not take those courses.

Music education has many other possible advantages. One researcher studied records of 25,000 high school students. The students who studied music had higher grades than students who did not study music. They also missed fewer days of school and participated in more community activities. Studying music may have increased the students' discipline and concentration. Music classes could also be beneficial for students' memorization skills.

Children benefit greatly from music education. As a result, it should continue to be taught in schools. Quality music programs have been proven to increase student test scores and support learning in all subject areas. It can help children not only in their schooling but also for many years to come.

1. Which phrase in the conclusion restates part of the claim?
  - A. "should continue to be taught in schools"
  - B. "increase student test scores"
  - C. "support learning in all subject areas"
  - D. "for many years to come"
2. What is one example of a transition or other cohesive language used in the conclusion?  
\_\_\_\_\_
3. Which two pieces of evidence are summarized in the conclusion?  
\_\_\_\_\_  
\_\_\_\_\_

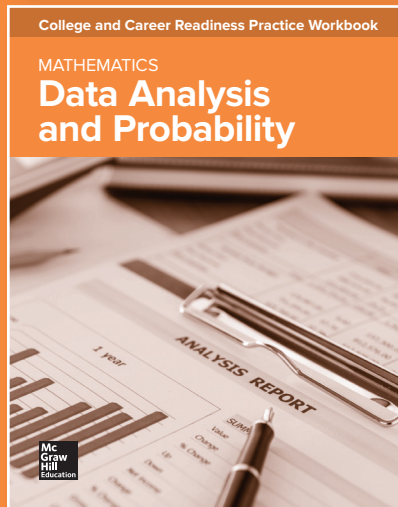
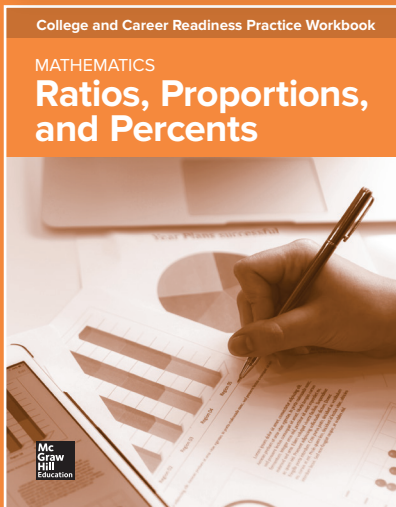
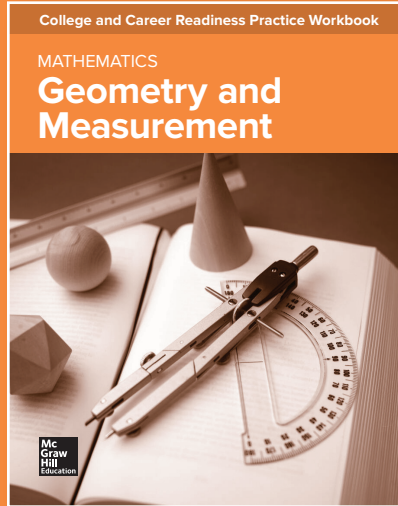
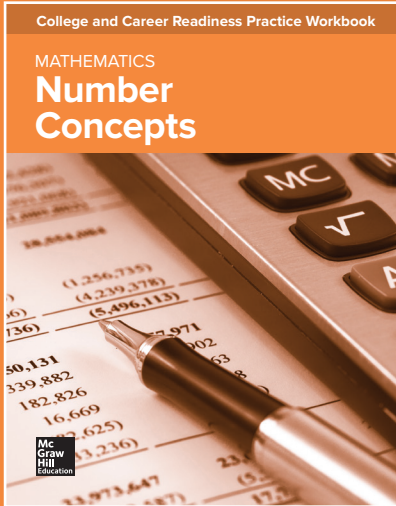
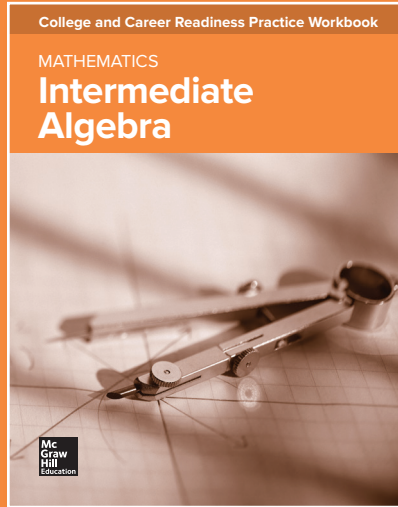
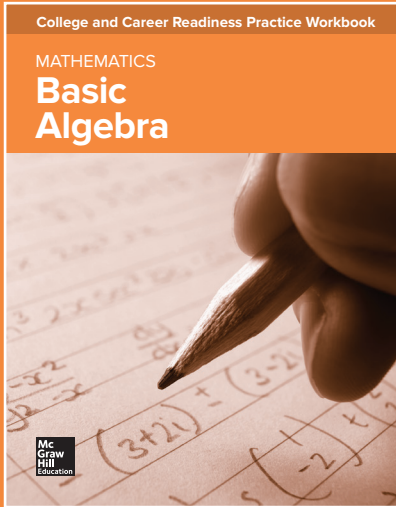
4. Why do you think the author's conclusion is the shortest part of this essay?  
\_\_\_\_\_  
\_\_\_\_\_

#### Extended Response

*Write your response on a separate piece of paper.*

Reread the persuasive essay on music education. Do you agree with the author's opinion? If so, write a new conclusion paragraph in your own words. If you disagree with the author, write a summary conclusion of why the author is incorrect. You may want to include similar words and ideas as the introductory paragraph, but be sure to restate them in a new way.

# Mathematics







A **relation** is a set of ordered pairs that consist of **inputs** and **outputs**. A **function** is a rule that has exactly one output for each input. In other words, no inputs can repeat in a function with a different output. A function can be graphed by the set of **ordered pairs**  $(x, y)$  that represents each input with its corresponding output.

### Function Vocabulary

A function uses many different symbols and words to describe the same thing. The chart below lists the corresponding terms for input and output.

Input	Output
$x$	$y$
Domain	Range
Independent Variable	Dependent Variable
$x$	$f(x)$

### Function Notation

An equation can be rewritten in function notation. For example  $y = -2x + 4$  can be rewritten as  $f(x) = -2x + 4$ , where  $f(x)$  replaces  $y$ . This is pronounced “ $f$  of  $x$ .”

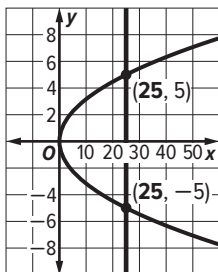
**Note:** Function notation can also be represented with different variables, such as  $h(g) = -2g + 4$ .

### Function Representation

Functions can be represented with words, ordered pairs, tables, graphs, arrow diagrams, and equations.

### Vertical Line Test

You can test the function of a graph by using the vertical line test. The graph below does not pass the vertical line test because the vertical line hits the graph in 2 places. Notice how the inputs, or  $x$ -values, repeat and produce two different  $y$ -values.



## Review the Skill

Read the questions and explanations to learn how to find the answers.

### Example 1

Find  $f(3)$  for the function:  $f(x) = 2x + 5$

#### Steps to a Solution

- ① Substitute 3 in for  $x$ .  $f(3) = 2(3) + 5$
- ② Use the order of operations to solve.  
 $f(3) = 6 + 5$

**Correct Answer:**  $f(3) = 11$

### Example 2

Jaymee is buying notebooks that cost \$1.49 each.

- A. Write a function to determine how much Jaymee will spend.
- B. Are there any constraints on the function?
- C. If Jaymee buys 5 notebooks, how much will she spend?

#### Guided Solution

- A. The total cost that Jaymee will spend equals the cost of a notebook multiplied by the number of notebooks. Since the total cost is unknown, define it as the dependent variable,  $f(x)$ . The number of notebooks is also unknown, so represent the independent variable as  $x$ .

**Correct Answer:**  $f(x) = 1.49x$

- B. Yes,  $x$  must be an integer greater than or equal to zero because you cannot buy a negative number of notebooks or a fraction of a notebook.

**Correct Answer:**  $x \geq 0, 1, 2, 3, 4, \dots$

- C. The number of notebooks is the independent variable,  $x$ . Because 5 notebooks were purchased,  $x$  should be replaced with 5 everywhere it appears within the function, so  $f(5) = 1.49(5)$ . This means the function at 5 (or the cost of 5 notebooks) is \$1.49 times 5 notebooks.

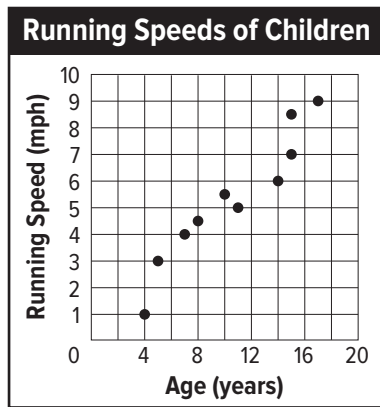
**Correct Answer:** Jaymee will spend \$7.45 for 5 notebooks.

## Practice the Skill

Answer the following questions. Show your work on a separate sheet of paper.

1. Label each relation below as a function or not a function and explain why.

A.




---



---



---

B.

<b>x</b>	9	0	0.5	2	$\frac{1}{8}$
<b>y</b>	2	-1.6	4	3	-7

---



---



---

C.  $\{(3, 4), (0, 2), (5, 2), (-7, 0.5), (\frac{1}{2}, -3)\}$

---



---



---

D.

Input	Output
4.5	0.88
2	4
1	$\frac{1}{5}$
1	-7

---



---



---

E.

Domain	-4	7	0.3	7
Range	2	$\frac{1}{2}$	-8	6

---

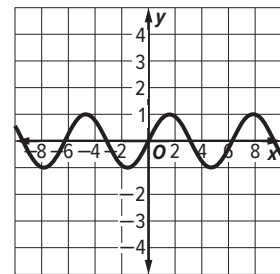


---



---

F.




---



---



---

### ■ Making Connections

#### Applying Functions to Everyday Life

People use functions to solve problems every day. For example, looking at your home's gas bill, you might see each MCF (1,000 cubic feet) of gas costs \$1.9834. You could write a function to display the situation:  $f(x) = 1.9834x$  where  $f(x)$  represents the cost and  $x$  represents how much you use. If you use 21.4 MCF of gas, you could substitute that in for  $x$ , so  $f(x) = 1.9834(21.4) = 42.44476$ , which is \$42.44.

If an MCF of gas costs \$2.2031, write a function to display how much gas will cost you. How much will your bill be if you use 31.5 MCFs?

2. For the function  $g(x) = -\frac{3}{4}x + 8$  find  $g(-12)$ .

- A. 2.7
- B. 7.9
- C. -1
- D. 17

3. Represent the following situation in function notation. Use  $f(x)$  for function notation. Jose has \$800 in savings. He earns \$650 each week.

A. Write a function that will help determine how much money Jose will have in a given period of time.

---



---

B. How would the function change if \$475 went to budgeted expenses each week?

---



---

C. Are there any constraints or parameters on the function?

---



---

D. After budgeted expenses, how much money will Jose have in 8 weeks? Hint:  $f(x) = f(8)$

---



---

**Vocabulary**

Remember that the **independent variable** is the input of the function.

4. In the function  $d = 1.25t$ , which is the independent variable?

---

5. Fill in the table below with the following numbers, so that it remains a function: 3, 2, 7, 4

$x$	___	2	3	___	5
$y$	1	___	2	___	4

6. The function  $P(s) = -0.2s^2 + 10s - 15$  represents the monthly profit of a person selling hand-knit slipper socks on an online marketplace site, where  $P$  represents profit and  $s$  represents the number of packages of socks sold.

A. What is the value of the function when  $s = 30$ ?

---



---

B. What is the meaning of the value in this context?

---



---

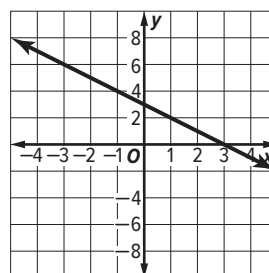
C. Are there any constraints or parameters on the function?

---



---

7. What is the value of  $g(1)$  in the graph below?




---

8. Does the table below represent a function? Explain.

<b>x</b>	4	-2.1	0.5	-8	$\frac{1}{2}$
<b>h(x)</b>	3	5	4	$\frac{7}{9}$	-1

---



---



---

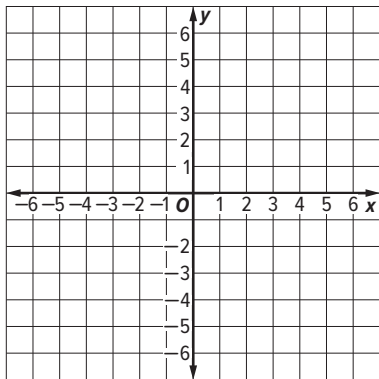
9. Find the range of  $f(x) = 0.2x^2 + 1$ , when the Domain =  $\{-3, 0, \frac{1}{2}, 1.2\}$ ,  
Range = \_\_\_\_\_.

10. Which value for x will make this relation a function?

$\{(5, -1), (x, 3), (-2, 4), (8, 0), (0.25, -6)\}$

- A. 5                                      C. 3  
B. -2                                      D.  $\frac{1}{4}$

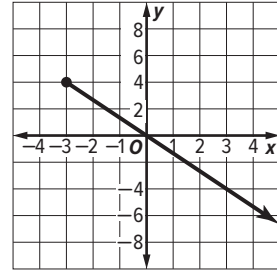
11. Evaluate the function  $h(g) = -g^2 - 2g + 6$  when  $g = -3, g = -1, g = 0, g = \frac{1}{2}$ , and  $g = 1$ . Then graph the corresponding points.



► **Avoiding Common Errors**

Make sure you use the order of operations when substituting. Remember to find  $(-3)^2$  and then multiply by  $-1$ . For  $h(-3)$ :  $-(-3)^2 - 2(-3) + 6 = -(\mathbf{9}) - 2(-3) + 6 = -\mathbf{9} + 6 + 6 = 3$

12. Use the graph below to complete the sentence.



The Domain of this function is \_\_\_\_\_

- A.  $x \leq -3$                               C.  $x \geq -3$   
B.  $y \leq 4$                                 D.  $x \leq 4$

and the Range is \_\_\_\_\_

- A.  $y \leq 4$                                 C.  $x \geq -3$   
B.  $x \geq 4$                                 D.  $y \geq 4$

13. Jenna says the table below represents a function. Martin says that it doesn't. Who is correct and why?

Input	Output
3	0
-2	0
0.7	0
$\frac{3}{5}$	0

---



---



---

14. If  $h(-4) = 6$ , which statement is true?

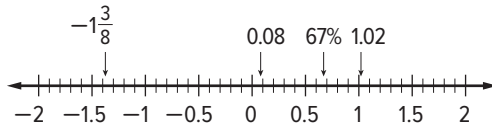
- A. The point  $(-4, 6)$  lies on the graph of  $y = h(x)$ .  
B. The point  $(6, -4)$  lies on the graph of  $y = h(x)$ .  
C. The point  $(-4, 6)$  lies on the graph of  $y = f(x)$ .  
D. The point  $(4, -6)$  lies on the graph of  $y = h(x)$ .

## Comparing and Ordering Rational Numbers

In order to **compare rational numbers**, you must be able to convert between different forms of numbers. These include fractions and mixed numbers, decimals, and percentages. Here are some examples of equivalent forms of the same number.

$$0.08 = \frac{8}{100} = \frac{2}{25} \quad 67\% = \frac{67}{100} = 0.67 \quad -1\frac{3}{8} = -\frac{11}{8} = -1.375 \quad 1.02 = \frac{102}{100} = 102\%$$

To compare two or more rational numbers, change them to the same form. To compare fractions, either convert them to decimals or write them as fractions with the same denominator.



### Review the Skill

Read the questions and explanations to learn how to find the answers.

#### Example 1

Order the numbers from least to greatest:

$$1\frac{3}{4}, 99\%, -\frac{44}{53}, |-1.5|$$

#### Steps to a Solution

- Start with the big picture: there is only one negative number, so it is least.
- Write the other numbers as decimals and compare.

$$1\frac{3}{4} = 1.75 \quad 99\% = 0.99 \quad |-1.5| = 1.5$$

First, compare the whole number parts.  
If the whole number parts are the same,  
compare the decimals parts.

**Correct Answer:**  $-\frac{44}{53}, 99\%, |-1.5|, 1\frac{3}{4}$

#### Example 2

Write a decimal that is equivalent to  $-8\frac{3}{4}$ .

#### Guided Solution

Start by converting the mixed fraction to an improper fraction:

$$-8\frac{3}{4} = -8 + \frac{3}{4} = -\frac{(8 \times 4)}{4} + \frac{3}{4} = -\frac{32}{4} + \frac{3}{4} = -\frac{29}{4}$$

Then divide the numerator by the denominator to get the decimal.

**Correct Answer:**  $-7.25$

#### Example 3

Which number has the greatest value?

- |                         |                            |
|-------------------------|----------------------------|
| <b>A.</b> 140%          | <b>C.</b> $-10\frac{1}{2}$ |
| <b>B.</b> $\frac{9}{5}$ | <b>D.</b> $-1.8$           |

#### Guided Solution

The greatest value will be the farthest right on the number line. Start by looking at the big picture and see if any choices can be eliminated. Option C is a large negative number so you know it will be the farthest left on the number line. Convert each remaining number to a decimal. To write a percent as a decimal, move the decimal point two places to the left.

**Correct Answer:** B

#### Example 4

Mary found a sale that advertised  $\frac{1}{4}$  off the regular price of scarves. What is the percentage off the total price?

#### Guided Solution

Remember that percent means “parts per 100.” Write the fraction as an equivalent fraction with 100 in the

$$\text{denominator: } \frac{1}{4} \times \frac{25}{25} = \frac{25}{100}$$

**Correct Answer:** 25%

## Practice the Skill

Answer the following questions. Show your work on a separate sheet of paper.

1. Which number has the least value?

A.  $-5.7$   
B.  $-5\frac{8}{10}$   
C.  $-5\frac{3}{100}$   
D.  $-5.85$

2. Fill in each blank with  $<$ ,  $>$ , or  $=$ .

$$1.334 \text{ \_\_\_\_ } 1.35$$

$$|-1.3| \text{ \_\_\_\_ } 140\%$$

$$33\% \text{ \_\_\_\_ } -2\frac{1}{2}$$

$$-\frac{2}{3} \text{ \_\_\_\_ } -\frac{3}{4}$$

3. A lab technician must arrange samples by the amount of sodium they contain. The samples are listed below.

Sample A: 1.3 mg

Sample B:  $1\frac{1}{4}$  mg

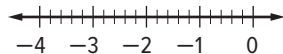
Sample C:  $\frac{7}{5}$  mg

Sample D:  $1.9 \times 10^2$  mg

Use the letters to list the samples in order from least to greatest.

\_\_\_\_\_

4. Use the number line below to graph each of the following values:  $-3\frac{1}{2}$ ,  $-\frac{13}{6}$ ,  $-0.85$ .



5. An office manager is comparing prices for the same paper from different suppliers. The following amounts of paper are offered for the same price. Which is the best deal?

A. 12.11 lb  
B.  $12\frac{7}{8}$  lb  
C. 12.6 lb  
D.  $12\frac{4}{5}$  lb

6. Convert the following to decimals.

A.  $2\% = \text{\_\_\_\_}$

B.  $\frac{2}{9} = \text{\_\_\_\_}$

C.  $121\% = \text{\_\_\_\_}$

D.  $\frac{4}{25} = \text{\_\_\_\_}$

7. Convert the following to percentages.

A.  $3.8 = \text{\_\_\_\_}$

B.  $\frac{2}{5} = \text{\_\_\_\_}$

C.  $0.0025 = \text{\_\_\_\_}$

D.  $2\frac{1}{2} = \text{\_\_\_\_}$

8. Convert the following to fractions.

A.  $26\% = \text{\_\_\_\_}$

B.  $1.75 = \text{\_\_\_\_}$

C.  $7\% = \text{\_\_\_\_}$

D.  $0.012 = \text{\_\_\_\_}$

### Making Connections

#### Applying Rational Numbers in the Real World

Many consumer transactions use percentages and fractions. It is important to be able to compare them to find the best deal possible. For example, if one bank offers  $1\frac{1}{4}\%$  interest and another offers 1.05% interest, you must be able to determine which percentage is greater in order to choose the best deal.

Susie and Frank are getting married. They each have accounts with different banks. Susie's bank offers  $3\frac{3}{4}\%$  interest on home equity loans. Frank's bank offers 3.65% interest on the same type of loans. They both think that their bank is offering the better deal. Which bank is actually offering a better rate for the couple?

## Rates, Ratios, and Ratio Tables

**Ratios** compare two numbers or quantities using division. While a fraction is always a part-to-whole relationship, a ratio can compare a part to a part or a part to a whole. A **rate** is a special ratio in which the two terms compared are in different units. A group of 3 men and 2 women has a rate, or ratio, of men to women of 3 to 2. This can be written using words (3 to 2), using a colon (3 : 2), or as a fraction ( $\frac{3}{2}$ ). It is a part-to-part ratio, because the men and the women make up different parts of the whole. A group of 18 men and 12 women has the same ratio:  $\frac{18}{12} = \frac{3}{2}$ . Suppose that, in all, there are 5 people in a group with 2 women. The ratio of women to people, 2 : 5, is a part-to-whole ratio.

### Review the Skill

Read the questions and explanations to learn how to find the answers.

#### Example 1

The faces on Mt. Rushmore are 60 feet tall and the eyes of the presidents are 11 feet wide. A replica in the souvenir store is 6 inches tall. How wide are the eyes on the replica? The mouths on the replica are 1.8 inches wide. How wide are the mouths on the statue? Complete the ratio table to answer the questions.

	Total Height	Eye Width	Mouth Width
<b>Mt. Rushmore</b> (in feet)	60	11	?
<b>Mt. Rushmore</b> (in inches)	720	132	?
<b>Replica</b> (in inches)	6	?	1.8

#### Steps to a Solution

- Determine the ratio.  
Use the same unit of measure for the statue and the replica. The ratio of statue to replica is 720 inches : 6 inches, or 120 : 1.  
The ratio will be the same between the sizes of the eyes, so divide by 120. The eyes on the replica will be 1.1 inches wide.
- The ratio of replica to statue is 6 inches : 720 feet, or 1 : 120. The ratio will be the same between the sizes of the mouths, so multiply by 120 to get the size in inches. The mouths on the monument are 216 inches. Divide this number by 12 inches to get the size in feet: 18 feet, wide.

**Correct Answer:** eyes: 1.1 inches; mouth: 216 inches or 18 feet

#### Example 2

A recipe for salsa uses 5 tomatoes and 2 peppers, and makes 6 pints. How many peppers do you need if you have 10 tomatoes? How many tomatoes do you need if you have 6 peppers? How many tomatoes and peppers do you need to make 24 pints? Complete the ratio tables.

<b>tomatoes</b>	5	10	?	20
<b>peppers</b>	2	?	6	?
<b>total ingredients</b>	7	?	?	?
<b>pints</b>	6	12	18	24

#### Steps to a Solution

The ratio of tomatoes to peppers in the recipe is 5 : 2. For twice as many tomatoes, 10 tomatoes, the recipe needs twice as many peppers. For 3 times as many peppers, 6 peppers, you will need 3 times as many tomatoes. For 4 times as many pints, 24 pints, you need 4 times as many tomatoes and peppers.

**Correct Answer:**

<b>tomatoes</b>	5	10	15	20
<b>peppers</b>	2	4	6	8
<b>ingredients</b>	7	14	21	28
<b>pints</b>	6	12	18	24

## Practice the Skill

Answer the following questions. Show your work on a separate sheet of paper.

- A pharmacy technician mixes a solution using 9 liters of saline and 3 liters of medicine. What is the ratio of medicine to total solution?
  - $\frac{1}{12}$
  - $\frac{1}{9}$
  - $\frac{1}{4}$
  - $\frac{1}{3}$
- A factory has a workers-to-manager ratio of 4 to 1. What is the ratio of managers to all employees? Express your answer using a colon. The ratio of managers to all employees is \_\_\_\_\_.
- The elevator that takes passengers from the lobby to the observation levels of the Empire State Building travels 100 feet in 5 seconds.
  - What is the speed of the elevator as a rate in feet per second? \_\_\_\_\_
  - What is the time it takes the elevator to travel from the lobby to an observation level at 1,050 feet, to the nearest second? \_\_\_\_\_
- Jaime makes lemonade with a ratio of 2 cups of sugar for every 7 cups of juice. Linda makes lemonade with a ratio of 3 cups of sugar for every 11 cups of juice. Whose lemonade is sweeter? Explain your answer.

---



---

### Building Ratio Tables

In a ratio table, the relationship between each pair of corresponding numbers is constant. That means that dividing any output by its corresponding input gives the same value. It also means that if, for example, an input is doubled, then the corresponding output is also doubled.

### Making Connections

#### Comparing Prices

When shopping, you often need to compare sizes and prices to determine the best deal. Supermarkets often have this cost comparison on the shelf price tags for all items. It lets you see the price per same unit (for example, cents per ounce) for all the different brands and sizes.

You want to buy a frozen pizza at the supermarket. At Store A, the cost of a 12-oz cheese pizza is \$4.50; at Store B, the cost of a 14-oz cheese pizza is \$5.45. Which store has the better buy? Explain your reasoning. Note: To compare prices, you will need to use the “unit rate,” which is a ratio, or rate, with a denominator of 1.

- The tables below show breaks required to be taken by drivers at two different trucking companies. Which statement is true?

#### Company A

Minutes Driven	60	120	240
Minutes on Break	5	10	20

#### Company B

Minutes Driven	66	132	165
Minutes on Break	6	12	15

- Company A requires drivers to take more break minutes.
- Company B requires drivers to take more break minutes.
- The required number of break minutes is the same for both companies.
- A comparison cannot be made from the data in the tables.

### Extended Response

Write your response on a separate piece of paper.

- A nutritionist told her client that the foods he eats should have at least 3 grams of fiber for every 150 calories. Which of the foods below meet this requirement? Explain your answer. Use estimation in your reasoning.

Food	Fiber (in g)	Calories
Crackers	2	100
Apple	2.4	53
Granola Bar	3.5	200



## Adding and Subtracting Rational Expressions

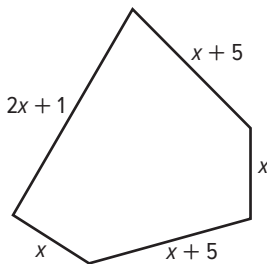
Adding and subtracting rational expressions is just like adding and subtracting other rational numbers. However, when adding and subtracting rational expressions, you can only combine **like terms**. Like terms have the same variable parts, or the same base raised to the same power. Constants are like terms.

### Review the Skill

Read the questions and explanations to learn how to find the answers.

#### Example 1

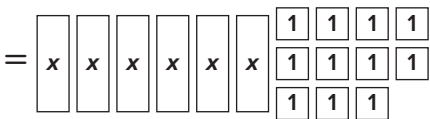
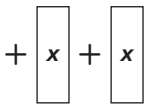
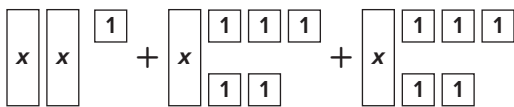
The diagram shows the dimensions of a nail salon, in feet. What is the perimeter of the salon, in terms of  $x$ ?



#### Steps to a Solution

1 Represent the sum with algebra tiles.

$$(2x + 1) + (x + 5) + (x + 5) + x + x$$



2 Write the sum in terms of  $x$ .

$$(2x + 1) + (x + 5) + (x + 5) + x + x = 6x + 11$$

**Correct Answer:** The perimeter of the salon is  $6x + 11$  feet.

#### Example 2

Simplify the expression shown.

$$(x^2 - 5x + 6) - (2x^2 + x - 4)$$

#### Guided Solution

Subtracting a polynomial is the same as adding its opposite.

$$\begin{array}{r} x^2 - 5x + 6 \\ - (2x^2 + x - 4) \\ \hline \end{array} = \begin{array}{r} x^2 - 5x + 6 \\ + (-2x^2 - x + 4) \\ \hline \end{array}$$

Combine like terms.

$$(x^2 - 2x^2) + (-5x - x) + (6 + 4) = -x^2 - 6x + 10$$

**Correct Answer:**  $-x^2 - 6x + 10$

#### Example 3

A rectangular swimming pool is 3 ft longer than twice its width. A contractor is hired to put a fence  $y$  ft around the pool. Write an expression to represent the perimeter of the fence.

#### Guided Solution

Draw a picture of a rectangular pool surrounded by a rectangular fence. Label the width of the pool  $x$ , and label the length of the pool  $2x + 3$ .

Label the distance between the pool and the fence  $y$ . Remember to label the distance for both lengths and widths  $y$ , so you should have a  $y$  on each side. This means the length of the fence is  $2x + 3 + 2y$  and the width is  $x + 2y$ .

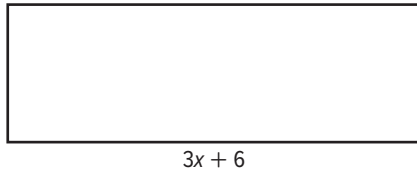
The perimeter of the fence is  $P = l + w + l + w$ . Remember to add the length twice and the width twice.

**Correct Answer:**  $6x + 6 + 8y$

## Practice the Skill

Answer the following questions. Show your work on a separate sheet of paper.

1. A rectangle is shown below. The width of the rectangle is one-third the length. What is the perimeter of the rectangle in terms of  $x$ ?



2. The area, in square units, of a community center is represented by the expression  $3x^2 - 5x + 17$ . A new annex is being built with an area of  $x^2 + 2x + 10$ . Which expression represents the new total area of the center?

- A.  $4x^2 - 7x + 27$
- B.  $4x^2 - 3x + 27$
- C.  $2x^2 - 3x + 27$
- D.  $2x^2 - 3x + 17$

3. Simplify:  $(2x^3 - x + 4) + (3x^2 + x + 3xy)$

4. Draw algebra tiles to model the polynomial subtraction. Then write the difference algebraically.

$$(5x^2 + 2x - 4) - (2x^2 + x - 1)$$

5. Which option shows the sum in simplified form?

$$(x^3 - 5x^2 + 3) + (3x^3 + 2x^2 - 5)$$

- A.  $4x^3 - 2x^2 - 2$
- B.  $4x^3 - 2x^2 - 8$
- C.  $4x^3 - 3x^2 - 2$
- D.  $4x^3 - 3x^2 - 8$

6. Simplify the expression:

$$x + x + x + y + y + xy - y + (-x) - 2xy - x$$

7. Simplify the expression. Show your work.

$$(2xy - 8x^2 + 9x^2y + x) - (xy - x + 8x^2 - 4x^2y + 3xy^2)$$

### ▶ Avoiding Common Errors

When subtracting polynomials, don't forget to distribute the negative sign to everything in the parentheses. For example,  $(2xy - 8x^2 + 9x^2y + x) - (xy - x + 8x^2 - 4x^2y + 3xy^2)$  should be rewritten as  $(2xy - 8x^2 + 9x^2y + x) + (-xy + x - 8x^2 + 4x^2y - 3xy^2)$ .

8. A rectangular garden is 6 ft shorter than twice its width. A landscaper wants to put a fence  $y$  ft around the garden. Write an expression to represent the perimeter of the fence.

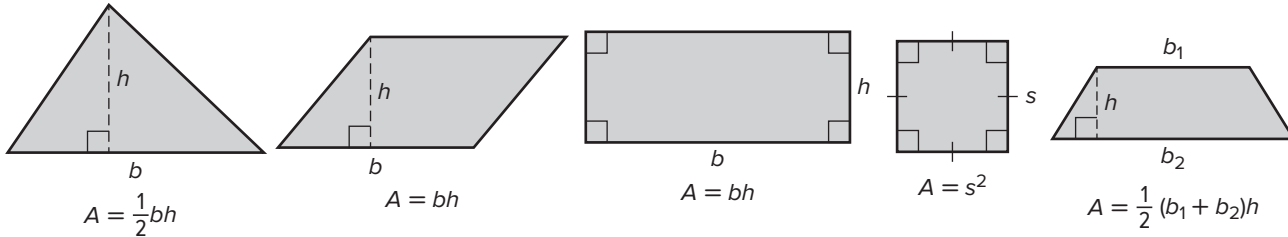
9. The length of a building is  $8x - 3$  meters, and the perimeter is  $20x - 2$  meters. Find the width of the building.

Lesson **4**

# Perimeter and Area of Polygons

The **perimeter** of a polygon is the distance around it; it is the sum of the lengths of its sides. The **area** of a polygon is the amount of space it covers; it is the number of square units required to cover the figure with no gaps or overlaps.

Here are some common area formulas. In the formulas,  $b$  = length of the base,  $h$  = height, and  $s$  = side length.



## Review the Skill

Read the questions and explanations to learn how to find the answers.

### Example 1

Wyoming is shaped like a rectangle that is 276 miles wide and 354 miles long. There are 1,300,000 cattle in the state. What is the population density of cattle?

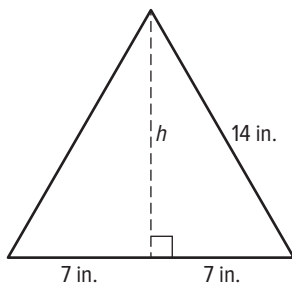
#### Steps to a Solution

- 1 Determine what the question is asking for. Density is the number per area, so this would be cattle per square mile. The area is needed.
- 2 Find the area. For a rectangle, the area is length times width.  
 $A = 276 \times 354 = 97,704$  square miles
- 3 Find the density. Divide the number of cattle by the area.  
 $1,300,000 \div 97,704 = 13.3 \approx 13$

**Correct Answer:** There are about 13 cows per square mile in Wyoming.

### Example 2

Find the area of the triangle shown.



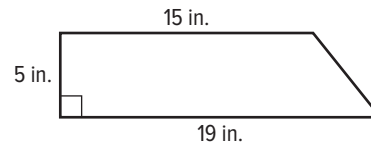
#### Guided Solution

First use the Pythagorean Theorem to find the height:  $7^2 + h^2 = 14^2$ . Simplify to  $49 + h^2 = 196$ . Subtract 49 from both sides to get  $h^2 = 147$ , so  $h \approx 12.12$  in. Then use the area of a triangle formula:  $A = \frac{1}{2}(14)(12.12)$ . Remember the whole length of the base is 14 in.

**Correct Answer:** The area is about 85 in<sup>2</sup>. Note that answers may vary slightly due to rounding.

### Example 3

A designer is planning a mosaic in the shape of a trapezoid with the measurements shown. The mosaic tile costs \$3.75 per square inch. Find the cost of the tile to cover the entire mosaic.



#### Guided Solution

Use the area formula for a trapezoid to find the area.  
 $A = \frac{1}{2}(15 + 19)(5) = 85$  square inches  
Then multiply the area by the cost of tile per square inch.

**Correct Answer:** \$318.75

## Practice the Skill

Answer the following questions. Use a standard ruler as needed. Show your work on a separate sheet of paper.

1. A rectangular mural with a height of 5.5 m and a width of 2.1 m has a perimeter of \_\_\_\_\_ and an area of \_\_\_\_\_.

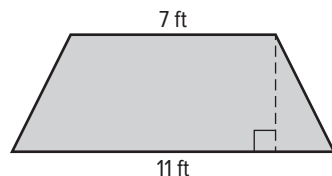
Daniel wants to make a vegetable garden with an area of 36 square feet. Use this to answer questions 2–4.

2. The fencing that will go around Daniel's garden costs \$5.15 per foot and can only be bought in whole numbers of feet.
  - A. If the garden is square, each side will be \_\_\_\_\_ feet long.
  - B. The square garden would have a perimeter of \_\_\_\_\_ feet.
  - C. The fencing for the square garden would cost \$\_\_\_\_\_.

### Isosceles Trapezoid

An isosceles trapezoid is symmetrical about a line, perpendicular to the parallel sides, drawn down its center. The non-parallel sides are congruent. The two top angles are congruent, and the two base angles are congruent.

3. Daniel is considering making the vegetable garden in the shape of an isosceles trapezoid instead of a square.



- A. If the area of the trapezoidal garden is 36 square feet, what is the height? Show your work.

---

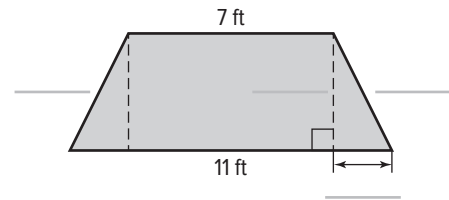


---



---

- B. Fill in the missing lengths on the diagram with exact values (use radicals).



- C. The trapezoidal design has a perimeter of about \_\_\_\_\_ feet.
- D. How much would it cost Daniel to fence in the garden? \_\_\_\_\_

4. Compare the square and trapezoidal designs for the vegetable garden (from questions 2 and 3). Which design will save money on fencing? How much would Daniel save?

---



---



---

5. If a trapezoid has an area of  $42 \text{ in}^2$ , a height of 7 in, and a base of 4 in, find the missing base.

---



---



---

6. The area of a rectangle is  $36 \text{ cm}^2$ , and John cuts the rectangle along its diagonal to form two triangles.

- A. What is the area of one of the triangles? Explain.

---



---

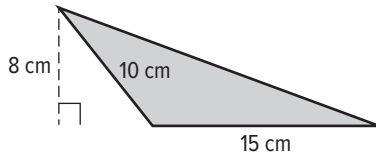
- B. What is the relationship between the formula of a rectangle and a triangle?

---



---

7. What is the area of the triangle below?



- A.  $33 \text{ cm}^2$
- B.  $60 \text{ cm}^2$
- C.  $120 \text{ cm}^2$
- D.  $150 \text{ cm}^2$

► **Avoiding Common Errors**

Be sure to include units in your answers. Perimeter is a length, so it is given with units, and area is always given in square units.

Also be aware of the units that measurements are given in and the units that the answer should be given in. One or more measurements may need to be converted to solve a problem.

8. An artist is building a frame for a rectangular painting. The painting is 10 inches by 2 feet. How much wood is needed for the frame? Show your work.

---



---

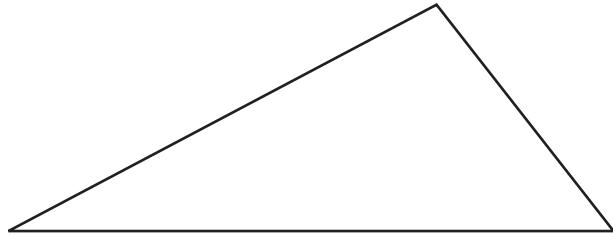


---

9. A plot of land is shaped roughly like a parallelogram. The shorter sides measure 1,250 meters each, and the longer sides measure 3.3 km each.

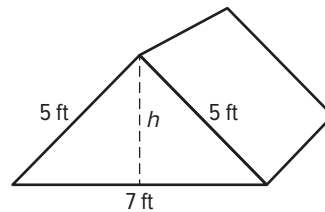
- A. Sketch a diagram of the land.
  
- B. If the landowner walks at an average speed of 7 km/h, it should take her \_\_\_\_\_ hours and \_\_\_\_\_ minutes to walk around her land.

10. A graphic designer is working on a logo for a company. The logo includes the triangle shown below.



- A. Use a centimeter ruler to measure the lengths of the sides to the nearest tenth of a centimeter. What is the perimeter of the triangle? \_\_\_\_\_ cm
- B. Draw a line to show the height of the triangle and measure it. What is the area of the triangle? \_\_\_\_\_  $\text{cm}^2$

11. A painter wants to paint the front triangular face of the sculpture below. What is the area of the triangular face?




---



---

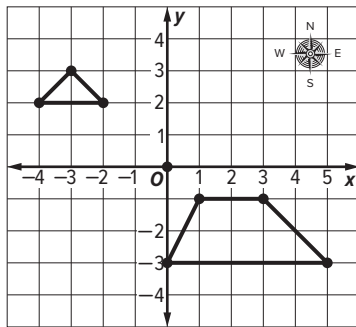


---

12. The length of the side of a rectangular garden is 3 times the width.

- A. If the area is  $75 \text{ yd}^2$ , what is the perimeter?  
 \_\_\_\_\_  
 \_\_\_\_\_
- B. If fencing costs \$21.44 per foot, how much will the fencing cost?  
 \_\_\_\_\_  
 \_\_\_\_\_

13. An assistant in the city planner's office is studying a map of the town. City Hall is at the center, and each unit on the map represents 1 km.



- A. The triangular park is going to have a border of flowers planted around its perimeter. To the nearest tenth, the perimeter of the park is \_\_\_\_\_ km.
- B. The parks department wants to have a trash can every 200 m along the southern edge of the park. There will need to be \_\_\_\_\_ trashcans.
- C. The trapezoid represents a college campus. The campus has an area of \_\_\_\_\_  $\text{km}^2$ .
- D. There are 3,416 students living on campus. The population density of the campus is \_\_\_\_\_ people per square kilometer.
- E. The track team ran twice around the perimeter of the campus this morning. To the nearest tenth of a kilometer, they ran \_\_\_\_\_ km.
14. A farmer can plant 160,000 soybeans per acre in his 20-acre field. An acre = 43,560 square feet.
- A. If the length of his farm is 13,200 feet, what is the width?  
\_\_\_\_\_
- B. How many soybeans can he plant per square foot?  
\_\_\_\_\_

- C. If he increases his acreage by 10 percent, how many soybeans can he plant?  
\_\_\_\_\_

15. A triangle has a base of 4.5 cm and a height of 6 cm. Marcus found the area to be 13.5 cm. Janine calculated the area to be 27  $\text{cm}^2$ . Who is correct?  
\_\_\_\_\_  
\_\_\_\_\_

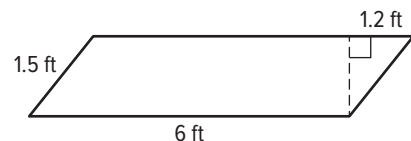
16. The area of a square is 72.25  $\text{cm}^2$ . Find the perimeter.  
\_\_\_\_\_  
\_\_\_\_\_

17. A city was designed in the shape of a trapezoid, where the length of one end of the city is 7 miles long and the length of the other end is 4 miles long. The distance between the two lengths (which is the height of the trapezoid) is 3 miles. If there are 120,000 people in the city, what is the population density?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Extended Response

Write your response on a separate sheet of paper.

18. A landscape designer needs to replant grass in a patch of yard that is roughly shaped like the parallelogram shown. He spent \$17.55 on sod. Find the cost per square foot. Show your work and explain your reasoning.



### Making Connections

#### Calculating Perimeter and Area in the Workplace

In any profession that plans, designs, or builds things, it is essential to be able to find perimeters and areas. For example, a sign maker will add a decorative border to any sign for an additional \$1.50 per foot. A customer ordered a 15-ft by 3-ft rectangular banner with a border. What is the cost of the border? Show your work.

The fundamental counting principle states that if event  $A$  can occur in  $m$  ways and event  $B$  can occur in  $n$  ways, then the sequence of events  $A$  and  $B$  can occur in  $m \times n$  ways. For example, if you can choose from 5 types of muffins and 3 types of juice for breakfast, there are a total of  $5 \times 3 = 15$  different possibilities.

Arrangements of objects come in a variety of forms in the real world. A **permutation** is an arrangement in which order matters. A phone number is an example of a permutation. A **combination** is an arrangement in which order does not matter. Choosing 2 out of 3 sweaters to pack is an example of a combination.

In math, the exclamation point is used to indicate a **factorial**. To find a factorial, multiply the number by all of the whole numbers less than it. For example,  $4! = 4 \times 3 \times 2 \times 1 = 24$ . Most scientific calculators have a factorial key. Factorials are used in the counting formulas given below.

**Permutations:** Possible permutations of  $n$  objects taken  $r$  at a time is:  ${}_n P_r = \frac{n!}{(n-r)!}$

**Combinations:** Possible combinations of  $n$  objects taken  $r$  at a time is:  ${}_n C_r = \frac{n!}{r!(n-r)!}$

## Review the Skill

Read the questions and explanations to learn how to find the answers.

### Example 1

At a meeting of 20 club members, a president, vice-president, and secretary must be elected. How many possible ways can this be done?

#### Steps to a Solution

- Determine if the situation is a combination or permutation.  
Electing Jorge president and Elaine vice president is different from electing Elaine president and Jorge vice president.  
Order matters, so this is a permutation.

- Use the permutation formula. We are choosing 3 people from 20, so  $n = 20$  and  $r = 3$ .

$${}_{20}P_3 = \frac{20!}{(20-3)!} = \frac{20!}{17!}$$

- Use properties of factorials to simplify.

$$\frac{20!}{17!} = \frac{20 \times 19 \times 18 \times 17!}{17!}$$

Remove the common factor of  $17!$  from the numerator and denominator. The fraction is equal to  $\frac{20 \times 19 \times 18}{1}$ .

**Correct Answer:** There are 6,840 possible choices for the three officers.

### Example 2

A gourmet burger restaurant offers beef, turkey, veggie, and buffalo burgers. They also offer regular or gluten-free buns. How many combinations of a burger and bun are possible?

#### Guided Solution

Use the fundamental counting principle. There are 4 types of burger and 2 types of bun.

**Correct Answer:** There are 8 possible combinations of a burger and bun.

### Example 3

An airplane has room for 2 passengers, but there are 6 people waiting in line. How many ways can the 2 passengers be chosen?

#### Guided Solution

Determine if this is a permutation or combination. Since the order doesn't matter, it is a combination. The fundamental counting principle won't work because there would be redundancies. Use the combination formula.

$${}_{20}C_3 = \frac{6!}{2!(6-2)!} = \frac{6!}{2!(4)!} = \frac{6 \times 5 \times 4!}{2 \times 1 \times 4!}$$

**Correct Answer:** There are 15 possible combinations of passengers.

## Practice the Skill

Answer the following questions. Show your work on a separate sheet of paper.

- Juanita wears a uniform to work. She can wear navy or khaki pants with a polo shirt, button-down shirt, or sweater. How many possible outfits can she wear to work?  
**A.** 2                                    **C.** 5  
**B.** 3                                    **D.** 6
- ▶ Avoiding Common Errors**  
The word “combination” is commonly used in English but not in its precise mathematical meaning. When thinking through a counting problem, do not take the word “combination” at face value—you may need to use the fundamental counting principle or the permutation formula.
- Jim works for a custom sofa maker. Customers who buy a sofa can choose 2 of the following at no extra cost: delivery, custom throw pillows, fabric protection spray, or removal of an old sofa. How many possible combinations of the two options are there?  
**A.** Is this a combination or a permutation problem? Explain.  
\_\_\_\_\_
- B.** Find the solution. Show your work.  
\_\_\_\_\_
- Every employee who works at the cash register has a unique ID that they enter to log in. The ID is made up of 2 letters and 3 single-digit numbers. Letters and digits may be repeated.  
**A.** If the letters I and O are not used, there are \_\_\_\_\_ possible letters.  
**B.** There are \_\_\_\_\_ possible digits.  
**C.** The total number of possible IDs is  
\_\_\_\_\_  $\times$  \_\_\_\_\_  $\times$  \_\_\_\_\_  $\times$  \_\_\_\_\_  $\times$  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_
- A music instructor is selecting members for the chorus. He needs to choose 4 members from 18 applicants. How many possible combinations are there?  
\_\_\_\_\_

### Ordering Objects

The number of ways to arrange or order  $n$  objects is equal to  $n!$ . Think about ordering 3 books. You have 3 choices for the first book, 2 choices remaining for the second, and only 1 for the last book:  $3 \times 2 \times 1 = 3!$ .

- A production assistant will run 5 commercials during a television show break.  
**A.** In how many different orders can she play them? Show your work.  
\_\_\_\_\_
- B.** Use the permutation formula to solve the problem. Note that  $0! = 1$ .  
\_\_\_\_\_
- A sales manager is running a contest. The team member who sells the most during the month gets a \$200 gift card. The team member who comes in second gets a \$50 gift card, and the team member in third place gets a \$25 gift card. There are 7 team members. In how many ways can the gift cards be awarded?  
**A.** Is this a combination or a permutation problem? Explain.  
\_\_\_\_\_
- B.** Find the solution. Show your work.  
\_\_\_\_\_
- The maintenance department at a company needs to choose 4 people to be in charge of outdoor issues. There are a total of 14 people in the department. In how many possible ways can 4 people be chosen? Show your work.  
\_\_\_\_\_

### Extended Response

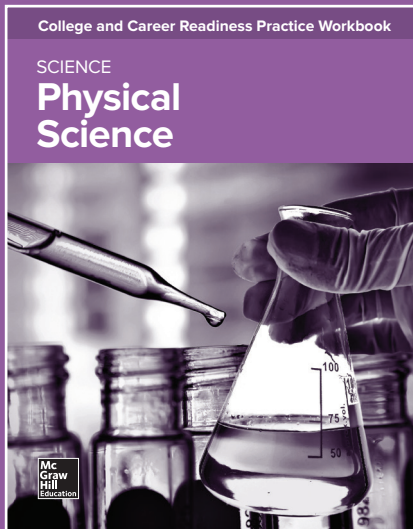
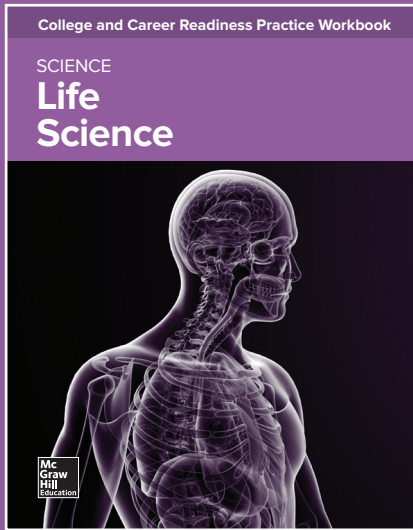
Write your response on a separate piece of paper.

- A restaurant is giving away a free meal to 5 winners. To enter, guests put their business card into a jar. The restaurant will choose 5 cards at random from the first 25 entries received, and each winner gets the same prize. Assume that there are no repeated business cards in the jar. Explain which formula should be used to solve the problem. Then find the solution.



# Science

---



## Life Science

- Lesson 1 **Energy Intake in the Human Body** ♦  
Use Context to Define Uncommon Terms
- Lesson 2 **Structure and Function in the Human Body**  
Understand Central Ideas and Summarize Concepts
- Lesson 3 **Inheritance and Variation of Traits**  
Examine Cause and Effect
- Lesson 4 **Human Body and Health**  
Analyze Quantitative Information
- Lesson 5 **Ecosystem Dynamics**  
Apply Quantitative or Technical Information
- Lesson 6 **Social Interactions and Group Behavior**  
Make Logical Inferences
- Lesson 7 **Evolution**  
Evaluate Multiple Sources of Information
- Lesson 8 **Ecosystems Disruption**  
Apply Scientific Practices to a Unique Situation

## Physical Science

- Lesson 1 **Electromagnetic Waves**  
Understand Central Ideas and Supporting Details
- Lesson 2 **Chemical Reactions**  
Summarize Complex Concepts
- Lesson 3 **The Atom** ♦  
Understand Technical Information
- Lesson 4 **Electricity and Magnetism**  
Apply Technical Information
- Lesson 5 **Electromagnetic Radiation**  
Quantitative Problem Solving
- Lesson 6 **Energy**  
Reason to a Conclusion
- Lesson 7 **Information Technologies and Instrumentation**  
Evaluate Multiple Sources of Information
- Lesson 8 **Collisions**  
Apply Scientific Practices to a Unique Situation

## Earth and Space Science

- Lesson 1 **Effects of Earth's Internal Processes** ♦  
Understand Central Ideas and Supporting Details
- Lesson 2 **Structures and Matter in the Universe**  
Summarize Complex Concepts
- Lesson 3 **The Role of Water in Earth Processes**  
Recognize a Sequence
- Lesson 4 **Weather and Climate**  
Apply Quantitative Information
- Lesson 5 **Human Impacts on Earth Systems**  
Quantitative Problem Solving
- Lesson 6 **Global Climate Change**  
Cite Evidence to Support Analysis
- Lesson 7 **Large-Scale System Interactions**  
Evaluate Multiple Sources of Information
- Lesson 8 **Plate Tectonics**  
Apply Scientific Practices to a Unique Situation

# Energy Intake in the Human Body

## Use Context to Define Uncommon Terms

When you come across unfamiliar words or science-specific terms, look for **context clues** to help you determine the word's meaning. Authors use several types of context clues, including definitions, restatements, examples, descriptions, synonyms, and antonyms. Context clues can be in the same sentence as the unfamiliar word or in the sentences before and after. When you come across an unfamiliar term, keep reading to look for context clues. If you do not find a clue, reread the previous sentence.

The human body is made up of several organ systems, such as the skeletal system, muscular system, circulatory system, digestive system, and respiratory system. Each system is made up of specialized organs that work together to allow the body to carry out specific functions.

The human body is also composed of many elements. In order for your body—and all your organ systems—to work, your body needs energy. That energy comes from the chemicals you eat and drink. As your body breaks down chemicals, it makes sure it has all of the compounds it needs.

## Review the Skill

Read the passage. Then read the questions and explanations to learn how to find the answers.

### The Respiratory System

The respiratory system allows you to breathe by taking in oxygen from the air. It is made up of the nose, mouth, throat, trachea (windpipe), bronchi, bronchiole, alveoli, and lungs.

When you inhale air through the nose or mouth, it travels down the trachea—a long tube that branches, or divides, into the bronchial tubes. One bronchial tube enters each lung. The air from the bronchial tubes enters the lungs and moves through small air passages. These small air passages are called bronchioles. Finally, the air reaches the alveoli, which are tiny balloon-like sacs at the end of the bronchioles inside the lungs. The oxygen from the air then moves through these balloon-like sacs into the blood and to your heart.

Your heart, which is part of the circulatory system, pumps the oxygen-infused blood throughout your body. As the oxygen travels through the body, a process called cellular respiration takes place in every cell. Cellular respiration is a series of chemical reactions. During these reactions, cells use oxygen and glucose—a simple sugar—to release energy. This energy fuels the body and cell growth.

### Example Question 1

Based on context, what are *bronchioles*?

- A. balloon-like air sacs below the lungs
- B. small air passages in the lungs
- C. tubes that enter the lungs
- D. tubes from the throat to the lungs

#### Interconnected Organ Systems

Your respiratory and digestive systems are closely connected. Oxygen, which enters your body through the respiratory system, is required for the process your cells use to release energy from food molecules. Specifically, oxygen is the gas that cells use for cellular respiration.

### Steps to a Solution

This question is asking you to use context clues to define the term *bronchioles*. Follow the steps below in the order shown:

- 1 Find the sentences with the word *bronchioles*.
- 2 Read the sentences and those before and after.
- 3 Look for clue words, phrases, and punctuation marks, such as em-dashes (—), commas, and parentheses.
- 4 Think about how the words or phrases after the clues help you understand the term's meaning.

**Correct Answer:** Option B

### Example Question 2

Which of the following phrases best defines *cellular respiration*?

- A. the process of air moving through the lungs
- B. the movement of oxygen through the blood
- C. the way in which glucose is created in the cells
- D. the series of chemical reactions in cells that release energy

### Guided Solution

The first part of the text passage describes how oxygen moves through the respiratory system. Note that *respiratory system* and *cellular respiration* are not the same. The last three sentences in the text passage describe the process of cellular respiration. Reread the last three sentences and look for words that signal the definition of the term.

**Correct Answer:** Option D

### Practice the Skill

Use the passage on the previous page to answer the following questions.

1. According to the text passage, what are *alveoli*?
  - A. small air passages
  - B. tiny air sacs within the lungs
  - C. a long tube that divides into two tubes
  - D. a windpipe
2. Based on context, what would be a reasonable definition for the term *respiration*?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. The respiratory system consists of the
  - A. nose, mouth, throat, trachea, bronchi, bronchiole, alveoli, and lungs.
  - B. heart, trachea, bronchi, bronchiole, alveoli, and lungs.
  - C. nose, mouth, throat, trachea, bronchi, heart, and circulatory system.
  - D. nose, mouth, throat, trachea, bronchi, bronchiole, cells, and heart.

### Strategies to Find Word Meaning

When you see an unfamiliar word, do not stop reading. Instead, try these strategies to help find context clues to define unfamiliar terms:

- Look for words and key phrases, such as *called, is, which means, for example, similar to, like, which are, and such as*. These phrases signal that the author will provide a definition, description, or example that will help you understand the term.
- Punctuation marks like em-dashes, parentheses, and commas can also signal that an author is restating the term in a simpler way or providing an example or a definition.
- Look for familiar words that may have similar meanings or opposite meanings. These may appear in the sentence with the unfamiliar term or in the sentences before or after the term.
- If a passage has text features, such as photographs, graphs, maps, and captions, study them closely. They may illustrate or help explain the meaning of the term or concept.

## Practice the Skill

Read the passage. Then answer the questions that follow.

► **As you read...** Remember to look for examples or descriptions to help determine the meaning of unfamiliar or science-specific terms. Also recall that certain punctuation marks can signal that the author is restating a term in a simpler way or providing an example.

### You Are What You Eat

The morning is half over and you need some energy, so you eat a piece of sour-apple candy. You have just consumed several chemicals: high-fructose corn syrup for sweet taste, citric and malic acid for tartness, and methyl butanoate for apple flavor. A *chemical* is just another name for “substance.” Whenever you eat or drink, you consume chemicals that your body needs for energy, growth, and repair.

The human body is made up of many different elements, including: oxygen (O), carbon (C), hydrogen (H), nitrogen (N), and calcium (Ca). The elements found in your body are not free elements; they are in the form of compounds. For example, up to 60 percent of your body is water, a compound of hydrogen and oxygen. Carbon is the most abundant element found in all the major molecules in living organisms, such as DNA, proteins, and carbohydrates. Therefore, most of a human’s body mass is made of oxygen, carbon, and hydrogen.

Your body is a complex chemical factory. It checks to see if the right amount of each compound is present, breaks down the food you eat, and uses the new substances formed to make compounds needed for growth and repair. It also breaks down other food components to obtain the energy it needs.

You might start the day with a breakfast of melon, eggs, whole-wheat toast, milk, and coffee. If you eat scrambled eggs, you are consuming a mixture of compounds, including water, globulins, amino acids, cholesterol, lipids (fats), fatty acids, and vitamin A, with a little sodium chloride (salt) sprinkled in. Doesn’t that sound mouthwatering?

4. Based on the context, what is *methyl butanoate*?

- A. a chemical that gives food apple flavor
- B. a chemical that gives food color
- C. a chemical that adds energy to food
- D. a chemical that makes food tart

5. What context clue does the author give to help you understand the term *sodium chloride*?

- A. The author gives examples.
- B. The author provides a definition.
- C. The author uses an antonym.
- D. The author describes it.

### Vocabulary

**Molecules** are made up of atoms of one or more elements. They are the smallest units into which a substance can be divided and still retain its properties.

6. Based on the text passage, you can assume that a compound

- A. is made of two atoms of the same element.
- B. consists of two or more elements.
- C. is a type of element.
- D. is another word for *molecule*.

7. What element(s) make up water?

- A. hydrogen
- B. oxygen
- C. hydrogen and oxygen
- D. hydrogen and carbon

**Vocabulary**

**DNA** is deoxyribonucleic acid, the genetic code for almost all organisms. DNA is made up of smaller units called *nucleotides*, each formed by a nitrogen base, a sugar, and a phosphate group.

8. According to the text passage, which of the following is the most abundant element in major molecules of organisms?
- A. oxygen
  - B. calcium
  - C. chlorine
  - D. carbon

9. Based on the text passage, identify five elements within in the human body.

---

---

---

---

---

10. What does the author mean when he or she describes the body as a “complex chemical factory”? Explain.

---

---

---

---

---

11. Based on the information in "You Are What You Eat," write a definition for the term *free element*. Then, use the word in an original sentence that also includes a context clue.

---

---

---

---

---

**Extended Response**

Write your response on a separate piece of paper.

The term *chemical* often has a negative connotation, or negative ideas or feelings associated with it. What are chemicals? Why do people often consider food with chemicals to be unhealthful? Why is it actually necessary to consume certain chemicals? Explain.

**Making Connections**

**Dietitians**

We know some chemicals are better for us than others. People who work in the field of *dietetics* teach others how to keep themselves healthy by eating the right chemicals for their bodies and health conditions.

The Academy of Nutrition and Dietetics in the United States lists several specialized careers in dietetics. For example, dietetic technicians help dieticians plan menus and prepare food. Other jobs focusing on nutrition include chefs and personal trainers.

Research information about healthful diets and the vitamins, minerals, and other elements your body needs. Then work with a partner to make a grocery list that includes a variety of vitamin-rich vegetables and fruits, as well as grains and protein.

**Technical information** may be presented in a text that explains a process or concept, or it may appear in visual form, such as a labeled diagram or model. To understand technical information, you must first carefully read *all* of the information presented, noting key words, titles, labels, or keys. Then you must make connections to synthesize all of the available textual and visual information and gain a greater understanding of the whole.

Scientist John Dalton developed the first modern atomic theory during the early nineteenth century. He believed that all matter was made up of tiny particles called **atoms**. An element is made up of one type of atom. By the 1860s, over 60 elements had been discovered. Yet scientists had not developed a good way to organize the information. Around this time, Russian chemist Dmitri Mendeleev began working on his own organizational method. He arranged the elements in rows in order of increasing mass. This arrangement resulted in elements with similar properties in the same column. Although he developed his table before subatomic particles were discovered, Mendeleev’s table looked much like the periodic table we use today.

### Review the Skill

Read the passage and study the image of the periodic table section. Then, read the questions and explanations to learn how to find the answers.

#### Patterns of Organization: It’s Element-ary!

All matter is made of elements, which are made up of atoms. Atoms are composed of subatomic particles: protons, neutrons, and electrons. No two elements have the same number of protons; therefore, in the periodic table, elements are arranged by the increasing number of protons. The number of protons an element has is called its *atomic number*. In the periodic table, the atomic number is above the element’s symbol. Some tables also include the number of electrons and their arrangement to the right of the symbol.

Because isotopes of a single element differ in their number of neutrons, their atomic masses differ as well. The number below the element’s symbol is its atomic mass. If an element has several isotopes, then this number is a weighted average of those isotopes. (Some tables do not include decimals for the atomic mass. So, for example, the atomic mass of potassium in a table without decimals is 39 rather than 39.0983.)

The elements are organized in rows and columns. Rows are called *periods*, and columns are called *groups*. Groups are an important feature in the organization of the periodic table because elements in the same group have similar properties and the same number of electrons in the outermost energy level.

#### Periodic Table

The Periodic Table of Elements, or **periodic table**, is an organized list of all known elements. Each square in the table has a label that includes the element’s name and its properties.

	1	
1	H	1
	Hydrogen	
	1.00794	
2	Li	2
	Lithium	1
	6.941	
3	Na	2
	Sodium	8
	22.98976928	1
4	K	2
	Potassium	8
	39.0983	8
		1
5	Rb	2
	Rubidium	8
	85.4678	18
		8
		1
6	Cs	2
	Caesium	8
	132.9054519	18
		18
		8
		1
7	Fr	2
	Francium	8
	(223)	18
		32
		18
		8
		1

### Example Question 1

Why does lithium (Li) have an atomic number of 3, but an atomic mass of 6.941?

- A. Lithium must exist in more than one isotope.
- B. Lithium always has four electrons and three neutrons.
- C. Lithium always has three protons and four electrons.
- D. Lithium must exist in only one isotope.

#### Steps to a Solution

- 1 Find the section of text that explains atomic mass. Underline this information.
- 2 Then reread the text section that explains isotopes, focusing on the potassium (K) example. Why is potassium's atomic mass not equal to two times its atomic number?
- 3 Study the answer choices. Which option identifies why the atomic mass is not two times the atomic number?

Correct Answer: Option A

### Example Question 2

Look at rubidium (Rb) on the periodic table section. What do the numbers 2, 8, and 18 represent?

- A. atomic mass
- B. atomic number
- C. electron arrangement
- D. isotopes

#### Guided Solution

Reread the text and look for the explanation of each number. Compare the placement of the numbers with the information in the text. The text explains that the electrons are listed to the right of the symbol in some versions of the periodic table.

Correct Answer: Option C

## Practice the Skill

Use the text passage and visual on the previous page to answer the questions that follow.

1. The atomic number of an element is equal to
  - A. its number of electron energy levels.
  - B. its number of neutrons.
  - C. its number of protons.
  - D. its atomic mass.
2. Study the periodic table section. Which group does this section show?
  - A. Group 3
  - B. Group 1
  - C. Group 2
  - D. Group 7
3. According to the text passage, what can you say about the elements in this group?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. According to the periodic table, what is the atomic number of the element sodium (Na)?
  - A. 3
  - B. 22.98976928
  - C. 11
  - D. 1



## Practice the Skill

Read the passage and study the image of the periodic table section. Then answer the questions that follow.

**As you read...** First preview the visual to the right of the text passage to identify what technical information is being presented. Then, as you read, underline important details that support the information in the visual. Think about how both the technical information and details you underlined help you to better understand atoms.

### Atomic Views

An atom is an element's smallest particle that still has the characteristics of that element. However, there are smaller particles called subatomic particles. Within the nucleus of an atom are protons and neutrons. A specific element always has the same number of protons. Each proton has a positive charge of +1. Neutrons weigh almost the same as protons, but they have neither a positive nor negative charge. Atoms of a given element do not always have the same number of neutrons. Atoms of the same element that have different numbers of neutrons are called isotopes. Isotopes affect the atomic mass.

Atoms have the same number of electrons as protons. Each electron has a negative charge of -1. Electrons orbit around the nucleus and are arranged in energy levels. The innermost energy level, energy level one, can only hold two electrons. Energy level two can hold up to eight electrons. An energy level may, or may not, fill up, depending on the number of electrons in the atom. Once energy level two is full, energy level three begins to fill, with the total number of electrons in the energy level dependent on the number of electrons in the atom. The maximum number of electrons in energy level three is 18, but energy level four will begin to fill once energy level three has eight electrons. The number of electrons in each energy level for an atom in its ground state is sometimes shown in the upper-right corner of each box of the periodic table, such as in the visual of Group 2 to the right of this passage.

### Group 2

The elements in Group 2 are the **alkaline earth metals**. These elements are generally hard, gray-white, and good conductors of electricity.

		2
2	4	2 2
	<b>Be</b>	
	Beryllium	
	9.012182	
3	12	2 8 2
	<b>Mg</b>	
	Magnesium	
	24.305	
4	20	2 8 8 2
	<b>Ca</b>	
	Calcium	
	40.078	
5	38	2 8 18 8 2
	<b>Sr</b>	
	Strontium	
	87.62	
6	56	2 8 18 18 8 2
	<b>Ba</b>	
	Barium	
	137.327	
7	88	2 8 18 32 18 8 2
	<b>Ra</b>	
	Radium	
	(226)	

5. How many protons does the element barium (Ba) have in its nucleus?

- A. 137
- B. 137.327
- C. 4
- D. 56

6. How many electrons are in energy level three of strontium (Sr)?

- A. 87.62
- B. 8
- C. 18
- D. 38

7. Study the periodic table section on the previous page. What is the relationship between this group and the group shown in the visual at the beginning of the lesson?

---

---

8. Why might an energy level have fewer than the maximum number of electrons it can hold? Give an example based on Group 2 of the periodic table.

---

---

9. Why is the atomic number always a whole number, while the atomic mass is sometimes a decimal? Think about what you read in the first text passage. Then, synthesize the information in both passages and in the visuals to answer the question.

---

---

---

---

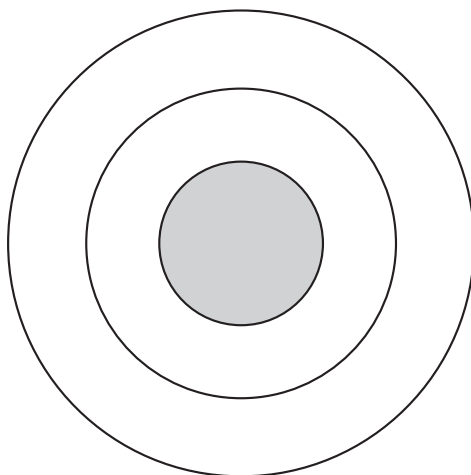
---

---

## Diagram

Follow the directions to complete the diagram below.

Complete a simplified diagram for the Group 2 element beryllium (Be). For the diagram, assume that the number of neutrons equals the number of protons. Label the nucleus, energy levels, and subatomic particles. Use a +1 for protons and a -1 for electrons. Use a 0 for neutrons.



### ■ Making Connections

#### Everyday Elements

It may seem like elements are something only scientists see or work with, but you actually interact with elements every day. For example, you eat fruits and vegetables, which include dietary elements like iron (Fe), zinc (Zn), and calcium (Ca). In fact, there are more than a dozen essential elements listed on the periodic table that your body needs to function properly. There are other elements that you wear or use in some way.

Research an example of the periodic table and look for elements that you wear, eat, or use in some way. Make a list of these elements, and explain how you use them.

# Effects of Earth's Internal Processes

## Understand Central Ideas and Supporting Details

The **central idea** of a text is the most important point the author wants to convey. In longer science texts, the central idea is often supported by one or more **main ideas**. These are the most important ideas in paragraphs or sections of text. The main ideas are then supported and developed by details. These **supporting details** can be facts, definitions, statistics, or examples.

Earth has a layered structure: a solid inner core, a liquid outer core, a semi-solid mantle, and a thin rocky crust. Together the crust and upper mantle compose Earth's lithosphere, which is broken into several plates. These tectonic plates are constantly shifting as they move on the flowing magma beneath the upper mantle. Volcanoes can form at plate boundaries where two tectonic plates either pull apart from each other or collide. Some volcanoes form at "hot spots" far away from plate boundaries. Eruptions occur when molten rock and pressurized gases from below break through Earth's surface, releasing lava, ash, and volcanic gas.

## Review the Skill

Read the passage. Then read the questions and explanations to learn how to find the answers.

### The Eruption of Mount St. Helens

Before 1980, Mount St. Helens had stood peacefully in the Washington state countryside for over 100 years. As serene as it seemed, volcanologists knew that Mount St. Helens was an active volcano. They were monitoring it. In mid-March, 1980, they detected several small earthquakes below the mountain. These quakes suggested that processes occurring beneath Earth's surface might soon awaken the volcano.

In late March, 1980, steam exploded from the top of the volcano, creating a new crater. The crater grew wider and the top of the mountain started cracking. By May 17, scientists had recorded more than 10,000 minor earthquakes. Rising magma from within Earth collected in the edifice, or main part, of the volcano. This resulted in a visible bulge on the north side of the mountain. The pressure from the trapped gases was enormous, and it continued to build.

On May 18, a strong earthquake shook the mountain, causing the bulge and the north face of the mountain to collapse in a great landslide. Pressurized gases were suddenly released, causing a huge lateral explosion to rip through the avalanche and over the surrounding hills. A massive column of ash and gas rose miles skyward and covered the surrounding area with hundreds of tons of ash as lava poured from the crater.

Mount St. Helens has erupted several times since 1980, though not as explosively. It now seems to have settled down. However, based on their understanding of plate tectonics and the conditions that cause volcanoes, scientists believe Mount St. Helens will erupt again in the future.

### Identifying Ideas and Details

Use these strategies to find the most important ideas in a text and the details that support them.

- Read the introductory paragraph and the conclusion. Authors often convey the central idea of the text near the beginning. They may also restate it near the end.
- Ask yourself, "*What important ideas support, or help me understand, the central idea?*" These are the main ideas. Also consider how all of the details in the paragraph or section are related. All of the supporting details in a section will work together to develop the main idea. While sometimes a main idea is stated directly, other times you have to infer the main idea by considering the details.
- To identify supporting details, look for details that relate to the main idea. Supporting details provide evidence for, and elaborate upon, the main idea.

### Example Question 1

What is the main idea of the second paragraph in the text passage?

- A. In the spring of 1980, scientists predicted that Mount St. Helens would soon erupt.
- B. In the spring of 1980, an explosion of steam created a new crater on Mount St. Helens.
- C. In the spring of 1980, a series of events at Mount St. Helens showed that pressure under Earth's surface was building.
- D. In the spring of 1980, over 10,000 minor earthquakes took place at Mount St. Helens, leading scientists to believe that pressure was building under Earth's surface.

#### Steps to a Solution

Remember that the main idea in a paragraph or section of text helps to support the author's central point about a topic. Use the following suggestions to identify the main idea of paragraph two.

- 1 Reread the paragraph. Ask yourself, "What is this paragraph mostly about?" Consider the supporting details the author chose to include. What is the common thread in all these details? How do all these details relate? What is the point that the author is making by including these details?
- 2 Read through the answer choices. Is each one referring to a detail from the paragraph or to a larger, overall idea?
- 3 Remember that sometimes a main idea is stated directly, but other times you have to infer the main idea by considering the supporting details.

Correct Answer: Option C

### Practice the Skill

Use the text passage on the previous page to answer the following questions.

- 1. Within the context of geology, what is an *edifice*?
  - A. Fine fragments of volcanic rock formed from an eruption.
  - B. The main portion of a volcano built by volcanic deposits.
  - C. The reservoir beneath a volcano's vent where magma is stored.
  - D. A basin-shaped depression caused by a volcanic eruption.

### Example Question 2

Which of the following details does the author use to support the idea that the eruption of Mount St. Helens on May 18, 1980, was *explosive*?

- A. "By May 17, scientists had recorded more than 10,000 minor earthquakes."
- B. "Pressurized gases were suddenly released, causing a huge lateral explosion to rip through the avalanche and over the surrounding hills."
- C. "Mount St. Helens has erupted several times since 1980."
- D. "Rising magma from within Earth collected in the edifice, or main part, of the volcano."

#### Guided Solution

Recall that supporting details elaborate upon the main idea or provide evidence that shows the main idea to be true. They may also help explain the central idea. Supporting details are directly related to the ideas they support. Remember that longer science texts usually has more than one main idea. Read through the answer choices and look for a detail that provides evidence that the 1980 eruption was *explosive*—extreme in degree, power, or effect. As you consider your options, note that the question asks specifically about the eruption on May 18, 1980, and not the events before or after.

Correct Answer: Option B

- 2. What is the central idea, or most important point, of "The Eruption of Mount St. Helens"?

---

---

---

## Practice the Skill

Read the passage and study the map. Then answer the questions that follow.

► **As you read...** Look for context clues to help you figure out the meaning of unfamiliar terms, such as *thermal*, *magma*, and *supervolcano*.

### Yellowstone Supervolcano

Each year, millions enjoy Yellowstone's scenic landscape. The park also hosts about 10,000 thermal features, including steaming geysers, colorful hot springs, and gurgling mud pots. The geologists at Yellowstone Volcano Observatory, however, know that beneath their feet lies one of Earth's largest and most explosive volcanoes.

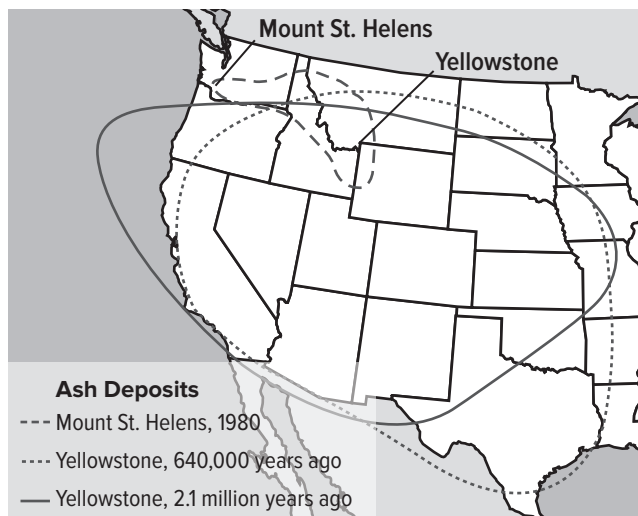
A hot spot has fueled Yellowstone for 17 million years. As the North American Plate moved over the hot spot, magma lifted upward. Parts of the crust melted, adding gas to a large magma reservoir. As gas accumulated, so did the pressure. The crust expanded. Eventually the crust cracked, and the molten rock exploded in a series of super eruptions. The most recent super eruptions occurred 2.1 million, 1.3 million, and 640,000 years ago.

An eruption similar to the last three super eruptions at Yellowstone has not been seen in human history. Consider the 1980 eruption of Mount St. Helens. Its eruption blasted out the northern side of the mountain. It ejected one cubic kilometer ( $\text{km}^3$ ) of ash into the sky and left a crater two kilometers (1.2 mi.) wide. The ash traveled as far east as the Rocky Mountains. This pales in comparison to the extent of the Yellowstone supervolcano's ash deposits.

Compared to Mount St. Helens, each of the last three super eruptions at Yellowstone left a caldera over 50 km (31 mi) wide. The most recent eruptions of the Yellowstone supervolcano ejected  $1,000 \text{ km}^3$  ( $240 \text{ mi.}^3$ ) of ash. This covered most of what is now the Western United States under several feet of ash and darkened the skies of the planet, resulting in a global winter.

Geologists admit it is not a matter of *if* the Yellowstone supervolcano will erupt again, but *when* it will erupt. So they monitor the park using global positioning systems (GPS) and satellite imagery to measure the ground movements. They have noticed that the land in the park bulges in cycles, sometimes shifting several meters at a time. The magma body that lies 10 km (6.2 mi.) beneath Yellowstone continues to bulge.

The map below compares ash deposits from the 1980 eruption of Mount St. Helens to ash deposits from two previous eruptions of the Yellowstone supervolcano.



### Vocabulary

A **hot spot** is a place in the upper mantle at which magma from the lower mantle upwells to melt through Earth's crust.

3. Which best describes the main idea of the second paragraph in the text passage?
  - A. Three volcanic eruptions have occurred at Yellowstone.
  - B. The melting of part of Earth's crust caused pressure to build up under the surface.
  - C. Movement of the North American Plate has resulted in super eruptions at Yellowstone.
  - D. The most recent eruption at Yellowstone occurred approximately 640,000 years ago.
4. Which of the following details best supports the idea that an "eruption similar to the last three super eruptions at Yellowstone has not been seen in human history"?
  - A. "This covered most of what is now the Western United States under several feet of ash and darkened the skies of the planet, resulting in a global winter."
  - B. "The magma body that lies 10 km (6.2 mi.) beneath Yellowstone continues to bulge."
  - C. Eruptions of supervolcanoes can sometimes cause changes in the weather.
  - D. "Geologists admit it is not a matter of *if* the Yellowstone supervolcano will erupt again, but *when* it will erupt."
5. Based on context, what is a *caldera*? Use evidence from the text passage to support your reasoning.  
\_\_\_\_\_  
\_\_\_\_\_

6. Why do you think the author uses ash deposit amounts to compare the super eruptions at Yellowstone to the 1980 eruption of Mount St. Helens?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. What is the main idea of paragraph five in "Yellowstone Supervolcano"?  
\_\_\_\_\_  
\_\_\_\_\_

8. What is the central idea, or the most important point, of "Yellowstone Supervolcano"?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. How do the central ideas of "The Eruption of Mount St. Helens" and "Yellowstone Supervolcano" help you to better understand the spatial (space) and temporal (time) scales of Earth's internal processes? Explain.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

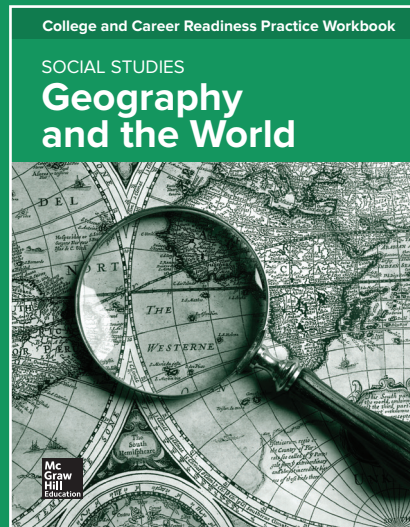
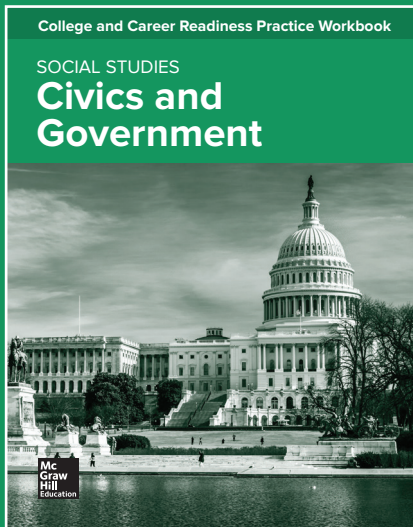
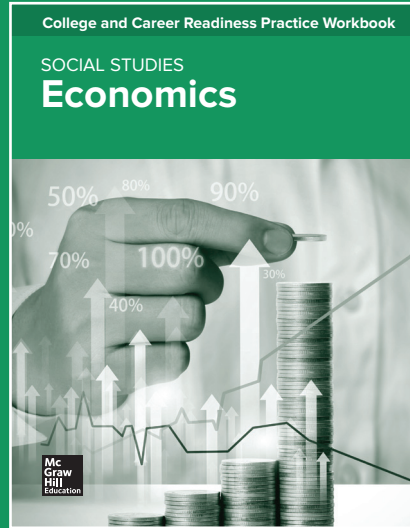
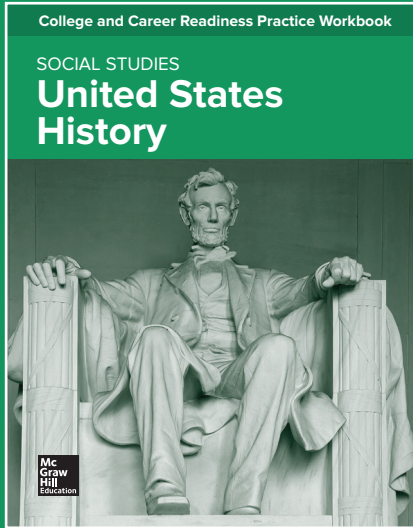
### Making Connections

#### Written Communication in the Workplace

When you receive a workplace document, such as a memo, e-mail, or report, you must first identify the most important information you need to know and remember. In other words, you must recognize the central idea and supporting details. But what do you do if you are unable to identify this information? You can ask for an explanation from the person who wrote it.

Write about a time when you had to interpret a document at work. Describe the situation. Was the most important information easy to recognize and understand? Or, was the document confusing and unclear? Did you have to ask for clarification from the sender? Explain.

# Social Studies



## United States History

- Lesson 1 **The Beginning of Our Nation**  
Determine and Summarize Main Idea
- Lesson 2 **A Growing Republic**  
Analyze the Sequence of Events
- Lesson 3 **Civil War and Reconstruction**  
Support Analysis with Evidence
- Lesson 4 **Industrialization**  
Interpret Information
- Lesson 5 **American Imperialism and Expansion** ♦  
Determine and Analyze Point of View
- Lesson 6 **Depression and Recovery**  
Recognize Trend in Data
- Lesson 7 **World War II and Recovery**  
Integrate Content Presented in Different Ways
- Lesson 8 **The Cold War**  
Analyze Cause and Effect
- Lesson 9 **Civil Rights**  
Evaluate an Argument and Supporting Evidence
- Lesson 10 **U.S. Foreign Policy Post-Cold War**  
Make Inferences

## Civics and Government

- Lesson 1 **Foundational Principles of American Democracy**  
Determine and Summarize Main Idea
- Lesson 2 **Compare Foundational U.S. Documents** ♦  
Use Context for Meaning of Unknown Word
- Lesson 3 **Structure of Government**  
Draw Conclusions
- Lesson 4 **Changes to the U.S. Constitution**  
Explain a Process
- Lesson 5 **Political Parties and Interest Groups**  
Analyze Point of View
- Lesson 6 **Political Speeches**  
Evaluate an Argument
- Lesson 7 **The Living Constitution**  
Analyze Cause and Effect
- Lesson 8 **Public Policy**  
Integrate Content Presented in Different Ways
- Lesson 9 **Civic Engagement**  
Evaluate the Reasoning of an Argument

## Economics

- Lesson 1 **Economic Systems** ♦  
Compare and Contrast
- Lesson 2 **Economic Factors**  
Analyze Visual Information
- Lesson 3 **Productivity and Specialization**  
Interpret Information
- Lesson 4 **Supply and Demand**  
Recognize Trends
- Lesson 5 **Price**  
Make Predictions
- Lesson 6 **Competition**  
Identify Main Idea and Details
- Lesson 7 **Money, Banking, and Personal Finance**  
Identify Relevant Information
- Lesson 8 **The Labor Market**  
Evaluate an Argument
- Lesson 9 **The Federal Reserve**  
Understand Organization

## Geography and the World

- Lesson 1 **Ancient Civilizations** ♦  
Identify the Main Idea and Supporting Details
- Lesson 2 **Classical Civilizations and Culture**  
Analyze Text to Compare and Contrast
- Lesson 3 **Region and Place**  
Interpret Maps
- Lesson 4 **Exploration and Settlement in the New World**  
Sequence Information
- Lesson 5 **Immigration**  
Integrate Content Presented in Different Ways
- Lesson 6 **Global Consequences of War**  
Analyze Cause and Effect
- Lesson 7 **Natural Resources and Sustainability**  
Analyze Data
- Lesson 8 **Population Trends**  
Make Predictions



An **author's point of view** is his or her opinion on a topic or issue. An author's point of view can influence the information provided. So an environmental historian might select information that supports a negative view on industrialization, because of the impact on natural resources. However, a business owner who relies on factories to produce goods would have a positive view on industrialization. To determine the author's point of view, think about the author's word choice, the information presented, and reasons for writing the text.

In the late 1800s and early 1900s, the United States followed a policy of imperialism. **Imperialism** means "the expansion of a country's power and influence, especially through or with the threat of military force." Through imperialism, the United States achieved one of its goals—**expansion**, or the growth of its territory. The United States gained control of the Philippines after it defeated Spain in the Spanish-American War in 1898.

## Review the Skill

Read the passage. Then read the example questions and explanations to learn how to find the answers.

### An Anti-Imperialist

I left these shores . . . a red-hot imperialist. I wanted the American eagle to go screaming into the Pacific. It seemed tiresome and tame for it to content itself with the Rockies. Why not spread its wings over the Philippines, I asked myself? And I thought it would be a real good thing to do.

I said to myself, here are a people who have suffered for three centuries. We can make them as free as ourselves, give them a government and country of their own, put a miniature of the American constitution afloat in the Pacific, start a brand new republic to take its place among the free nations of the world. It seemed to me a great task to which we had addressed ourselves.

But I have thought some more, since then, . . . and I have seen that we do not intend to free, but to subjugate [suppress] the people of the Philippines. We have gone there to conquer, not to redeem [rescue]. . . .

It should, it seems to me, be our pleasure and duty to make those people free, and let them deal with their own domestic questions in their own way. And so I am an anti-imperialist.

Source: From "Mark Twain Home, An Anti-Imperialist," *New York Herald*, 15 October 1900.

### Example Question 1

How did Twain's view of imperialism change?

- A. from pro-imperialism to anti-imperialism
- B. from being neutral to pro-imperialism
- C. from anti-imperialism to pro-imperialism
- D. from being pro-imperialism to neutral

#### Steps to a Solution

Remember, point of view is the author's opinion.

- 1 Read the text. Look for examples of how Twain expresses his opinion.
- 2 Look for reasons *why* Twain has a particular point of view on the topic and how it changed.
- 3 Choose the answer that best expresses how Twain's point of view changed.

**Correct Answer:** Option A.

### Example Question 2

Did Twain support or oppose American imperialism in the Philippines? What reason does he give to support his point of view?

---



---



---

#### Guided Solution

Reread the text. Look for details that show *what* Twain says about the topic and his beliefs and *why* he is saying it.

**Correct Answer:** Twain opposed American imperialism in the Philippines. His reason is that the United States went to the Philippines to conquer the people instead of to free them.

## Practice the Skill

Read the passage. Then answer the questions that follow.

By the early 20th century, the United States had interest all over the world and could not stay out of conflicts such as World War I. The following speech was given by President Woodrow Wilson in 1917. This speech was given just ten days after the United States had declared war on Germany, marking America's entry into the war.

### President Wilson's Proclamation Establishing Conscription (1917)

It is not an army that we must shape and train for war—it is a Nation. To this end our people must draw close in one compact front against a common foe. But this cannot be if each man pursues a private purpose. All must pursue one purpose. The nation needs all men; but it needs each man not in the field that will most pleasure him, but in the endeavour that will best serve the common good.

Thus, though a sharpshooter pleases to operate a trip-hammer for the forging of great guns and an expert machinist desires to march with the flag, the nation is being served only when the sharpshooter marches and the machinist remains at his levers. The whole nation must be a team, in which each man shall play the part for which he is best fitted.

To this end, Congress has provided that the nation shall be organized for war by selection; that each man shall be classified for service in the place to which it shall best serve the general good to call him.

The significance of this cannot be overstated. It is a new thing in our history and a landmark in our progress. It is a new manner of accepting and vitalizing our duty to give ourselves with thoughtful devotion to the common purpose of us all.

1. What is the point of view of Wilson's speech?
  - A. The nation must work as a team in time of war.
  - B. Citizens have a duty to avoid war at all costs.
  - C. The president can declare war without the agreement of the people.
  - D. Each person must ask themselves what is right regarding war.

2. What is Wilson's point of view on conscription, or the draft? How do you know?  
\_\_\_\_\_  
\_\_\_\_\_

3. What are three details or reasons that Wilson includes to support his point of view?  
\_\_\_\_\_  
\_\_\_\_\_

4. How did Wilson's word choice, style, and structure help you determine his point of view? Provide evidence from the speech.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Extended Response

*Write your response on a separate piece of paper.*

Choose one of the following questions, and write a paragraph that expresses your point of view on the topic. Provide reasons and evidence to support your point of view.

- Should the United States follow a policy of imperialism?
- Should the United States follow a policy of expansion?
- Should the United States institute a draft?

## Compare Foundational U.S. Documents

### Use Context for Meaning of Unknown Words

Historical texts often use words that are specific to a time period or topic. You might not be familiar with some of these words. When you come across unknown words, look for context clues. **Context clues** are words in the same sentence or in nearby sentences that provide hints to help you determine the meaning of a word. Examples of context clues include restatements, examples, explanations, synonyms, and antonyms. As you read, think about how words and ideas relate to each other and to the document. Recognizing relationships among ideas will help you understand the document better.

The Articles of Confederation was the first document written by the founders of the United States to establish a central government. It served as the foundation of the government from 1781 until 1789. Delegates from each state met in Philadelphia in 1787 to revise the Articles of Confederation. They soon decided, however, to replace it entirely. The United States Constitution was ratified two years later. The Constitution created a stronger central government, defined government power, and provided protection of individual rights.

## Review the Skill

Read the passage. Then read the example questions and explanations to learn how to find the answers.

### excerpt from Article IX, The Articles of Confederation

The United States, in congress assembled, shall have authority to appoint a committee, to sit in the recess of congress, to be **denominated**, "A Committee of the States," and to consist of one delegate from each State; and to appoint such other committees and civil officers as may be necessary for managing the general affairs of the united states under their direction—to appoint one of their number to preside; provided that no person be allowed to serve in the office of president more than one year in any term of three years; to ascertain the necessary sums of money to be raised for the service of the united states, and to appropriate and apply the same for defraying the public expenses; to borrow money or **emit** bills on the credit of the United States, transmitting every half year to the respective states an account of the sums of money so borrowed or **emitted**—to build and equip a navy—to agree upon the number of land forces, and to make requisitions from each state for its quota, in proportion to the number of white inhabitants in such state, which requisition shall be binding.

### Example Question 1

Which of the following words is closest in meaning to the word *denominated*?

- A. arranged
- B. managed
- C. required
- D. named

#### Steps to a Solution

Find the word *denominated*, and reread the sentence before and after it.

- 1 Look at the words before *denominated*. Who or what is being denominated?
- 2 Look at the words after *denominated*. What happens when someone or something gets denominated?
- 3 Consider the answer choices. Replace *denominated* with each one. Which word makes sense?

**Correct Answer:** Option D.

### Example Question 2

Locate the words *emit* in the passage. Write two phrases that use context clues to tell you what *emit* means. Then write the meaning of the word.

---



---

#### Guided Solution

Look at the words before and after the word *emit*. The word *emit* is used in the sentences "to borrow money or **emit** bills on the credit of the United States" and "an account of the sums of money so borrowed or **emitted**." The word *or* after *borrowed* tells you that *emit* and *borrow* have opposite meanings. If you *borrow* money, you pay that money back. So, *emit* must mean the opposite.

**Correct Answer:** Context clues: "to borrow money" and "transmitting . . . an account of sums of money"; *emit* means "to give money out without expecting its return."

## Practice the Skill

Read the passage. Then answer the questions that follow.

► **As you read...** Historical documents may look different from text you read today. The style of the time period from which the historical document was created probably differs from today's style. Capitalization, punctuation, and the use of long sentences is common in historical documents. Words that are capitalized are usually key ideas or terms. Sometimes words are put into boldface type to call them out as important ideas. As you read, note that capitalized words and words in bold are important to understand. Look for context clues to determine their meaning.

### excerpt from The United States Constitution

#### Article II, Section 1.

The executive Power shall be vested in a President of the United States of America. He shall hold his Office during the Term of four Years, and, together with the Vice President, chosen for the same Term...

#### Article II, Section 2.

The President shall be Commander in Chief of the Army and Navy of the United States, and of the Militia of the several States, when called into the actual Service of the United States; he may require the Opinion, in writing, of the principal Officer in each of the executive Departments, upon any Subject relating to the Duties of their respective Offices, and he shall have Power to grant Reprieves and Pardons for Offences against the United States, except in Cases of Impeachment.

He shall have Power, by and with the Advice and **Consent** of the Senate, to make Treaties, provided two thirds of the Senators present **concur**; and he shall nominate, and by and with the Advice and Consent of the Senate, shall appoint Ambassadors, other public Ministers and **Consuls**, Judges of the supreme Court, and all other Officers of the United States, whose Appointments are not **herein** otherwise provided for, and which shall be established by Law: but the Congress may by Law **vest** the Appointment of such inferior Officers, as they think proper, in the President alone, in the Courts of Law, or in the Heads of Departments.

1. What is the purpose of Article II, Section 1? Consider what you read and your understanding of the Constitution.

---

---

2. What is the purpose of Article II, Section 2? Consider what you read and your understanding of the Constitution.

---

---

3. What is the only type of case in which the President cannot grant a pardon?

- A. military                      C. congressional  
B. public                         D. impeachment

4. Use context clues from the text to complete the table.

Word	Definition or Meaning
Article	
Consent	
concur	
Consuls	
herein	

5. Based on context clues, what is the definition of *vest*?

- A. block  
B. place  
C. remove  
D. limit

Authors often **compare and contrast** two or more people, events, objects, or ideas. Authors compare what is similar, or alike, and contrast what is different. For example, authors may discuss two opinions about an important issue, such as raising interest rates. The article would compare what was the same about the ideas and contrast the ways in which the ideas differ.

There are three main economic systems: command, market, and traditional. Governments control **command economies**. In this economic system, the government makes all of the decisions about what is made, how it is made, and for whom the goods are produced. In a **market economy**, consumers buy what they want, which drives what is made and how it is sold. **Traditional economies** are guided by traditions—goods are produced the same way over generations, and methods for performing tasks are handed down.

## Review the Skill

Read the passage. Then, read the questions and explanations to learn how to find the answers.

### Resources and the Economy

Every country has different kinds of resources. Countries also have different uses for their resources. Resources include natural resources, labor or human resources, and capital resources. Natural resources are the materials that come from the earth that people use to produce goods. They include natural gas, oil, coal, wood, and minerals. Labor or human resources are the people who produce goods and provide services. Capital resources are the goods that are produced and used to make other goods, such as machinery and computers.

A country's economy, or how goods and services are used and sold, is directly related to the resources available. The types of resources available help determine what goods and services can be made, how resources can be used, and who will buy these goods and services. For example, if natural resources are scarce, the government may decide to control how they are used. This may lead to a command economy. In a traditional economy, the government may be distant or nonexistent, and all decisions about resources are based on tradition, or what people have done for years, and geography. In a market economy, the government has little or no control over resources. Instead, individuals, companies, and the market determine how resources are used.

### Example Question 1

Based on the information in paragraph 2, which statement about market economies is true?

- A. The government controls use of resources.
- B. Tradition decides use of resources.
- C. Consumer decisions affect use of resources.
- D. The government influences use of resources.

#### Steps to a Solution

- 1 Focus on the last three sentences of the passage. What do they say about market economies?
- 2 Now, compare each type of economy. Look for how decisions about resources are made.
- 3 Reread the answer choices, along with the information about economies. If a statement does not apply to market economies, eliminate it as a possible answer.

Correct Answer: Option C.

### Example Question 2

How are decisions about resources different for a market economy compared to a command or traditional economy?

#### Guided Solution

Remember that when you compare and contrast information, you must look for details about what is the same and what is different. To answer this question, find details that tell how market economies differ from command and traditional economies.

**Correct Answer:** The passage shows that decisions about resources in market economies are made by individuals and companies. Command economies are run by governments, while traditional economies follow traditions.

## Practice the Skill

Read the passage and chart. Then answer the questions that follow.

### Supply and Demand

There are many things that drive an economy.

- The *demand* for goods is the needs and wants consumers have, limited by their ability to pay.
- The *supply* is the way that businesses meet that demand. Each economic system treats supply and demand differently.
- The prices of goods and services are dictated by supply and demand. Supply and demand ideally work together to set prices that work for both buyer and seller.

### Types of Economies

The market, command, and traditional economies are the major types of economies. Some countries have a mixed economy, or features of both a command and market economy. In a mixed economy, both the government and entrepreneurs decide what should be made and how it should be made. Like a command economy, the government provides and controls some services like health care and education. Although the government has some control, in a mixed economy, individuals can start their own businesses and make a profit, and the laws of supply and demand influence what to produce and for whom to produce.

The chart lists examples of each type of economic system and shows how each economy answers the questions: *What is produced? How is it produced? and For whom is it produced?*

### Who Controls the Factors of Production

	Market Economy	Command Economy	Traditional Economy
<b>Example of Economy</b>	United States and European nations	Communist nations, such as China and North Korea	Nations not part of global economy, such as some South American or African nations
<b>What to Produce?</b>	Driven by consumer needs and wants	Driven by decisions of government, regardless of needs or wants of consumer	Nations not part of global economy, such as some South American or African nations
<b>How to Produce?</b>	Mainly driven by decisions by individuals and companies; government has influence	Driven by decisions of government, not individuals or companies	Driven by tradition; no new technologies, resource, or methods are introduced
<b>For Whom to Produce?</b>	Consumers creating demand	Consumers and government	Local citizens and/or government

- Based on the passage, which statement explains how the two types of economies in a mixed economy are different?
  - A command and market economy allows the government and entrepreneurs to decide.
  - In a traditional and command economy, the government decides.
  - A mixed economy only includes a traditional economy.
  - A market economy dictates that consumers and companies decide.
- Based on the passage and chart, in what way is a mixed economy similar to a market economy?
 

---

- Based on the passage and chart, how is a command economy different from a market and traditional economy?
 

---



---

### Extended Response

Write your response on a separate piece of paper.

Based on the information in the passages you read, both charts, and your prior knowledge, in what ways are a command economy and a traditional economy similar? In what ways are they different?

## Ancient Civilizations

### Identify the Main Idea and Supporting Details

The **main idea** of a text is the most important idea—it is what the author wants you to know about a topic or idea. In a longer text, there is more than one main idea, with each paragraph, section, or chapter having at least one main idea. Combine all of the paragraph or section main ideas to determine the overall text’s main idea. Main ideas may be directly stated or implied. Main ideas are supported by **details**, such as facts, examples, definitions, details, descriptions, quotations, and statistics. If the main idea is not directly stated, you need to think about how the details are related and draw a conclusion to determine the main idea.

A **civilization** is a well-organized and advanced society. There are six basic characteristics of a civilization: civics, central government, religion, social and economic classes, arts and architecture, and writing. Some of the earliest civilizations developed as people in large social groups used agriculture to sustain their social groups. Once they were able to grow a surplus of food, they could then begin an economic system and develop other skills. Around 3000 BC, the first civilization developed between the Tigris and Euphrates rivers. It was known as Mesopotamia.

## Review the Skill

Analyze the chart. Then, read the questions and supporting material to learn how to find the answers.

### Characteristics of a Civilization

Many people have created characteristics, or traits, that define a civilization; the lists often have varying characteristics. The chart here gives one list of the basic characteristics of a civilization.

Characteristic	Description
<b>Civics</b>	Citizens have rights, and citizens in different social classes have define roles.
<b>Central Government</b>	A government establishes laws to protect and control the citizens, city, and economy.
<b>Religion</b>	Religion establishes a belief system among citizens, and a basis for culture and arts.
<b>Social and Economic Classes</b>	Social and economic structures create a division of labor so that all jobs and responsibilities in the society are met.
<b>Arts and Architecture</b>	Arts and architecture represent a civilization and preserve its culture and beliefs.
<b>Written Language</b>	A written language promotes learning and communication and allows for trade and government. Writing also allows people to record history.

### Example Question 1

The main idea of the chart might be “There are six unique characteristics that describe a civilization.” How are the arts and architecture a supporting detail for this main idea?

- A. They represent one characteristic of the civilization and their culture.
- B. They record important events and dates in civilization’s history.
- C. They distinguish between the social and economic classes.
- D. They establish the civilization’s unique belief system.

### Steps to a Solution

The chart shows characteristics on the left and descriptions on the right.

- 1 Think about ancient buildings or structures you are familiar with, such as the pyramids, and what they represent.
- 2 Read the description next to each answer choice. Find the one that mentions aspects of a society’s culture.
- 3 Read the choices, and select the correct answer.

**Correct Answer:** A. Famous buildings, statues, and other structures are associated with certain civilizations. For example, when you think of the pyramids, you think of ancient Egypt. A monument represents a civilization and its culture or customs. Preserving and representing a civilization is important.

## Example Question 2

Identify the main idea and supporting details in the chart, and write a short paragraph summarizing them.

### Guided Solution

Remember that the main idea is the most important idea. Details support, or tell more about, the main idea.

Supporting details can be examples or explanations of the main idea. To summarize, include the most important ideas that tell about the main idea. Remember that a summary is written in your own words.

**Correct Answer:** The six characteristics of a civilization are civics, central government, religion, social and economic classes, art and architecture, and written language. Citizens must have rights and laws to protect them and organize society. Religion helps form culture and tradition, which writing, arts, and architecture preserve. Social and economic classes create a structure.

## Practice the Skill

Read the passage. Then, answer the questions that follow.

### What Made Mesopotamia a Civilization?

Thousands of years ago, in the areas now known as Iraq, Syria, and Turkey, the first known civilization developed. This civilization was known as Mesopotamia. The civilization itself rose after 3000 BC. Hunters and gatherers first settled in the area about 10,000 BC and began to farm the land. They developed simple tools to help them farm the land, and they domesticated animals to make farming more efficient. This rise in agriculture eventually led to a system of trading and an economy, which allowed Mesopotamians to focus on tasks other than farming.

People began to build cities. Social and economic classes formed. Some men became leaders and scholars. Others were merchants and laborers who did jobs that supported society. Priest rulers were in a position of authority until around 3600 BC. Then, a king, a form of government, and a set of laws were established.

Religious beliefs centered on gods who controlled every aspect of Earth and life, such as love, war, storms, earth, sun, and sky. The gods helped explain questions about how life and Earth worked and how people should act.

Several languages were used in Mesopotamia. The earliest written one was Sumerian. Sumerian was used for writing religious, government, and scientific documents, as well as literature. Many technological advances have been credited to the civilization. Examples include the invention of the wheel, the chariot, and the sailboat. The use of new materials and weaponry helped the Mesopotamians win battles and increase governmental control.

- Which of the following sentences best states the main idea of the passage?
  - The rise of agriculture enabled Mesopotamians to create a civilization.
  - The civilization of Mesopotamia lasted for centuries.
  - Mesopotamia was the first known civilization.
  - Mesopotamia was located near two fertile rivers.
- Which of the following details supports the idea that religion was an important part of the Mesopotamian civilization?
  - Religion helped citizens develop a code of behaviors.
  - Religion helped the civilization develop man-made laws.
  - Religion helped to develop a class system of tasks and jobs for citizens.
  - Religion helped establish rules that allowed women to own property.
- Identify two details that support the idea that Mesopotamia met all six characteristics of a civilization.  
\_\_\_\_\_  
\_\_\_\_\_

### Extended Response

Write your response on a separate piece of paper.

Make a chart that shows how Mesopotamia had each characteristic of a civilization.

Characteristic	Civilization





