



Eighth Grade

(8)

English Language Arts
Math
Social Studies
Science

Lesson 7

Active and Passive Voice



Introduction

Sentences can be stated in the active voice or the passive voice.

- In the **active voice**, the subject of the sentence clearly *performs* the action.

subject **action**
 [Maddy] won the All-Around Student Achievement Contest.

- In the **passive voice**, the subject *receives* the action expressed by the verb. The verb consists of a form of the helping verb *be* plus the past participle of the main verb.

subject **helping verb** **past participle**
 The [All-Around Student Achievement Contest] was won by Maddy.

- In the passive-voice sentence example, the subject of the sentence changed, but the overall meaning did not. Maddy performed the action of winning, but she was not the subject. The contest, which was the direct object of the action in the first sentence, is the subject of the second sentence.



Guided Practice

Underline the simple subject in each sentence. Then write A for active or P for passive to identify the voice of each sentence.

Hint

In the passive voice, the person who performs the action isn't always identified.

Example:

The award will be presented on Friday. The sentence doesn't tell *who* will present the award. *Award* is the simple subject, but it doesn't perform the action.

- Maddy is considered one of the best writers in school. _____
- She writes amazing articles for the school newspaper. _____
- Her report on ways to reduce waste in the cafeteria was chosen as Article of the Year. _____
- This year's spring play was also written by Maddy. _____
- The eighth grader even excels in math and science. _____
- Last year, she received a chance to go to Science Camp in Washington, DC. _____
- Camp applications were distributed to all students. _____
- Many students took advantage of the opportunity and applied. _____



Independent Practice

For numbers 1 and 2, which is the best way to change the voice in each sentence from active to passive without changing the meaning?

- 1** The committee chose three students to attend Science Camp.
- A** Science Camp was chosen for three students to attend.
 - B** Three students were chosen by the committee to attend Science Camp.
 - C** Science Camp was chosen for three students by the committee.
 - D** Three students who attended Science Camp were chosen by the committee.

- 2** The Science Camp sent the students a letter of acceptance.
- A** The Science Camp was sent a letter of acceptance for the students.
 - B** A letter of acceptance to the students was received from the Science Camp.
 - C** A letter of acceptance was received by the Science Camp for the students.
 - D** The students were sent a letter of acceptance by the Science Camp.

Answer Form

1 (A) (B) (C) (D)

2 (A) (B) (C) (D)

3 (A) (B) (C) (D)

4 (A) (B) (C) (D)

Number
Correct


4

For numbers 3 and 4, which is the best way to change the voice in each sentence from passive to active without changing the meaning?

- 3** Music Camp was applied to by more students than to Drama Camp this year.
- A** More students applied to Music Camp than to Drama Camp this year.
 - B** More students will apply to Music Camp than to Drama Camp this year.
 - C** More students applied to Drama Camp than to Music Camp this year.
 - D** Music Camp had more students apply to it than to Drama Camp this year.
- 4** Maddy, a smart and friendly girl, is liked by everyone.
- A** Maddy, a smart and friendly girl, will be liked by everyone.
 - B** Maddy, who is a smart and friendly girl, likes everyone.
 - C** Everyone likes Maddy, a smart and friendly girl.
 - D** Everyone is liked by Maddy, a smart and friendly girl.

Lesson 13

Using Context Clues

 **Introduction** Sometimes as you read, you may come to a word or a phrase that you don't understand. Often, you can determine the meaning of an unfamiliar word from its context, the words and sentences around it.

- Different kinds of context clues help readers figure out the meanings of words.

| Context Clue | Signal Words | Example |
|--------------|--|---|
| Definition | <i>is, or, which is, means</i> | The land pulls in opposite directions along a <u>fault</u> , which is a crack in the earth's crust. |
| Example | <i>for example, for instance, such as</i> | Geoscientists, such as geologists and <u>seismologists</u> , study earthquakes. |
| Comparison | <i>like, similar, also, as well</i> | Like a large earthquake, smaller <u>seismic</u> events may also be destructive. |
| Contrast | <i>but, or, yet, in spite of, however, whereas, although</i> | In <u>spite of</u> the chaos caused by an earthquake, <u>order is eventually restored</u> . |

- A word's position and function in a sentence can also be a clue to its meaning. What is the meaning of *geometrogomy* in this sentence?

Scientists measure the geometrogomy of earthquakes.

Geometrogomy isn't a real word! But if it were, you could figure out something about its meaning from its use in the sentence. Since it comes after the word *the*, you know that *geometrogomy* is a noun. And because of its use in the sentence, you also know that it is probably an observable "thing"—something scientists can measure.

 **Guided Practice** **Underline the context clue that can help you figure out the meaning of each underlined word or phrase. Write the meaning on a separate piece of paper.**

Hint

A context clue is often in the same sentence as an unfamiliar word. The clue may also be in a sentence that comes before or after the sentence that includes the difficult word.

Before they strike land, tornadoes can often be detected by Doppler radar, an electronic system that measures wind speeds. A tornado begins when a wind system forms a huge vortex. This formation is similar to water swirling toward a drain. This condition may trigger multiple tornadoes, which may occur simultaneously or one after the other. Whereas many regions are fairly safe from tornadoes, others are susceptible to them. Communities in tornado-prone areas try to mitigate their risk. For instance, they establish public warning systems.



Independent Practice

For numbers 1–4, use context clues to answer the questions about each paragraph.

The wind velocity, or speed of motion, in a violent tornado can reach 300 miles per hour. The effects of such a storm can be catastrophic, killing people and destroying wildlife. Within as little as a few seconds, a tornado can devastate a town in its path.

1 What does the word velocity mean in the paragraph?

- A** position
- B** change in direction
- C** swiftness
- D** size of something

2 What does the word catastrophic mean in the paragraph?

- A** dynamic
- B** productive
- C** tragic
- D** plentiful

Answer Form

1 (A) (B) (C) (D)

2 (A) (B) (C) (D)

3 (A) (B) (C) (D)

4 (A) (B) (C) (D)

Number
Correct

4

When weather forecasters predict a tornado, it is advisable for people threatened by the storm to find safe shelter. If the storm destroys property, emergency workers will do their best to accommodate storm victims. For example, they will set up shelters for those who lost homes.

3 What does the word accommodate mean?

- A** to provide with something needed
- B** to soothe and comfort
- C** to give necessary information
- D** to investigate in order to report on

4 What words from the paragraph helped you figure out the meaning of accommodate?

- A** "When weather forecasters predict a tornado"
- B** "people threatened by the storm"
- C** "emergency workers will do their best"
- D** "set up shelters for those who lost homes"

Determining Theme

Theme: *Teamwork*

You may read fiction for pleasure or entertainment. But did you know that most stories also provide lessons about life? These lessons are expressed through the **themes**, or messages, at the heart of what the author writes. Even your childhood stories have themes. For example, the story “Pinocchio” may have taught you the important lesson about honesty.

To identify a theme, connect ideas conveyed through the story’s setting, plot, and characters.

Study the image and caption below. Think about the message being conveyed.



A blind runner and his guide approach the finish line during a paralympic event in Malaysia.

Now, suppose the people in the picture are characters in a story. Consider what they are doing. Circle any details in the picture and caption that suggest a message or life lesson.

Read the chart below to see how analyzing details can help you determine a theme.

| Character Details | Setting Details | Action Details | Theme |
|---|--|---|--|
| <ul style="list-style-type: none"> • one sighted runner, acting as a guide • one blind runner who wants to be in a race | a track and field event for people with disabilities | the two runners are approaching the finish line | No matter what obstacles they face, people can accomplish amazing things through teamwork. |

Whether you read for pleasure, entertainment, or a school assignment, you can learn valuable lessons from stories. Thinking carefully about a story’s characters, setting, and plot—and how they work together—will help you figure out, or infer, the story’s theme.



Read the beginning of a story about a boy named Holden and his grandfather.

Genre: Realistic Fiction

Holden and Pops *by Evan Gerlachen*

“When you’re at your grandfather’s after school, be sure to do something other than sit by yourself playing video games, Holden.”

“I know, Mom, but what else is there to do?” whined Holden, washing cereal bowls.

“Have you ever tried to show him one of your games? At least you’d be doing something together,” Mom suggested.

“Oh, Pops wouldn’t be interested,” Holden shrugged as they headed out to the car. “Plus he’d never catch on—you know how he is about big, scary technology.”

As Holden got out of the car, Mom tried once more. “You know, Pops might surprise you. Keep your options open. You might even ask him about ‘big, scary technology’ some time.” Holden puzzled over her words on the way into school.

(continued)

Explore how to answer this question: “What do the details in this part of the story suggest about how people sometimes judge others?”

In most stories, authors do not state a theme directly. To figure out an author’s message, you need to look for key details and see how they develop over the course of the text.

Identify key details about each character’s attitudes and opinions. Then complete the chart below.

| Character | Comments About Pops | Attitude Toward Pops |
|-----------|---|---|
| Holden | Says Pops wouldn’t be interested in games and thinks technology is scary | |
| Mom | Suggests that Pops might be interested in video games and know something about technology | Seems to feel Pops is more interesting than Holden thinks |

With a partner, read aloud and act out the story’s beginning paragraphs. Then take turns explaining a theme, or lesson, that the author may be starting to develop in this part of the story.



Close Reading

On page 70, Holden doesn't want to spend time with Pops. On this page, **circle** words that tell how Holden's feelings change. Noticing how a character changes can help you understand a story's theme.

Continue reading about Holden and Pops. Use the Close Reading and the Hint to help you answer the question.

(continued from page 70)

That afternoon, Holden sat hunkered over his video game controller making vintage airplanes swoop across the screen.

"Whatcha doin', Son?" Pops asked.

"Just a game," Holden answered distractedly. Then, remembering Mom's advice, he made himself ask, "Wanna see?"

Pops settled next to Holden and immediately exclaimed, "Say, is that plane a Tomahawk? You know, she can go up to 20,000 feet to evade that enemy fighter."

Holden pivoted to gape in shock. Pops shrugged and said, "Didn't I ever tell you about the Tomahawk I flew in '41?"

Hint

Which choice helps explain why Holden's attitude toward Pops changes?

Circle the correct answer.

Which statement best expresses the theme of the story?

- A** Strong family bonds can develop only through shared interests.
- B** People from different generations have little in common.
- C** Children should always listen to advice from their parents.
- D** Assuming things about people may stop us from really knowing them.



Show Your Thinking

Look at the answer that you chose. Explain how specific text details helped you choose that answer.



With a partner, list and discuss additional life lessons that this story teaches. Use text details about characters, setting, and plot to support your discussion.



Read the story. Use the Study Buddy and the Close Reading to guide your reading.



Being aware of a character's feelings and how they change may help me figure out the theme of this story. So I'm going to underline words at the beginning and end of the story that reveal Angie's feelings.

Close Reading

Like many characters, Angie changes from the beginning to the end of the story. **Circle** text at the end of the story that reveals how she is different.

Look at the text you've underlined and circled. **Draw an X** next to the point in the story where it's clear that Angie has changed.

Genre: Realistic Fiction

One Word of Advice *by Charles Mills*

- 1 Angie was worn out preparing for the school career fair, which was her brainchild and her responsibility. She'd spent hours researching companies, contacting executives, and making sure the school had the technological capability to handle state-of-the-art presentations. With three days to go, she whisked into the media center and greeted her friend with, "Karim, I've been multitasking like crazy, and I still can't imagine how I'll get everything done."
- 2 Karim leaned over and said, "Delegate. Plenty of friends have offered their help, and you need to take them up on it."
- 3 Angie winced and clutched her clipboard more tightly. Deep down she was certain she was the only person who could get everything right. But Karim grabbed Angie's clipboard from her and flipped through the pages. "So. What seems most overwhelming to you?"
- 4 Angie groaned and sighed. Then she responded, "I'm not really sure how to evaluate the server's capabilities or the sound system's amplitude, and I don't know when I'm going to put together the introductory video."
- 5 Karim nodded, pulled a few pages out of the stack, and penciled names on each one. Then he handed them to Angie, and said, "I know people. Now delegate."
- 6 On the day of the fair, Angie looked as if she were having the time of her life when Karim saw her.
- 7 "Oh, Karim, did you see Danny's introductory video? Wasn't it fantastic? I could never have come up with that myself," she gushed. Angie realized that she needed to give credit where credit was due.
- 8 "From now on, call me Angie the Delegator; the best thing I ever did was hand that clipboard to you!"



Hints

Which sentence matches the author's description of Angie's actions and attitudes?

Which sentence describes Angie's attitude at the end of the story?

Which details best support the important theme of the story?

Use the Hints on this page to help you answer the questions.

- 1** At the beginning of the story, what is Angie's attitude?
 - A** She is frustrated by the lack of help she gets from her friends.
 - B** She trusts only Karim for reliable help and advice.
 - C** She thinks she's the only one competent to organize the event.
 - D** She is glad to be part of a team working on a project.

- 2** Which of the following sentences best describes an important theme about responsibility as described in "One Word of Advice"?
 - A** A strong leader bravely faces all challenges.
 - B** Good leaders trust others to do good work.
 - C** Seeking help is the last resort of a real leader.
 - D** People would rather give advice than lend a hand.

- 3** Select two pieces of evidence from "One Word of Advice" that support the correct answer to question 2. Check the boxes of your two choices.
 - "which was her brain child and her responsibility"
 - "'I've been multitasking like crazy'"
 - "the only person who could get everything right"
 - "'I could never have come up with that myself'"
 - "'how to evaluate the server's capability or the sound system's amplitude'"
 - "'the best thing I ever did was hand that clipboard to you'"



Read the story. Then answer the questions that follow.

from “The Canoe Breaker”

by Margaret Bemister

1 Once in a certain tribe there was a young man who had no name. For it was the law in that tribe that every youth had to do some deed that would give to him his name. This young man had tried in many ways to do something that would make the chief tell him that he was a great warrior. Several times he had tried to kill a bear, but had failed. He had gone forth in battle, hoping to kill some powerful enemy, but no one had fallen under his tomahawk. He had gone on long hunting trips, hoping to bring home the skin of some wild animal, but had always returned empty-handed. So his brave, young heart felt very sad, for the young men of the tribe laughed at him for not having won a name for himself.

2 One summer day, the tribe left their camp on the lake shore and went back among the hills on a hunting trip. After they had gone some distance, the young man left the others and wandered off by himself, hoping that this time he would kill some animal, and so be no longer scorned by his companions. He tramped for many hours through the forest and over the hills, without catching sight of anything. At length, he climbed one hill which was higher than the others, and from here he could see the small creek which flowed through the hills down to the lake. As he was looking at it, he thought he saw some dark objects along the shore of the creek. They seemed about the size of canoes. He scanned the hills anxiously, and at length could see a band of Indians making their way along the trail made by the hunters in the morning.

3 At once the young man knew there was great danger ahead, for these Indians, the Shuswaps, were the enemies of his tribe and now were following their trail, and when they found them, they would kill them. Quickly the young man made his way down the hill, and through the forest to the spot where the hunters had camped for their evening meal. Running up to them, he cried, “Return at once to your lodges. Our enemies are now on our trail. They are in the forest on the other side of this hill. I shall return and delay them while you reach your lodges in safety.”

4 Then, without waiting for a reply, he turned and ran back in the direction from which he had come. By short cuts through the hills, he made his way to the creek and found, as he expected, that the Indians had left their canoes tied at its mouth. Seizing his tomahawk, he began to break the canoes, and soon had a hole made in all of them except one. Leaving the creek, he mounted the hill and from there could see the Shuswaps. He began to wave his arms and call wildly to attract their chief. At last they noticed him and began to make their way towards him. The young man was delighted, for now he knew that his tribe could escape in safety, while their enemies were returning towards the creek. Soon the Shuswaps neared the top of the hill, and he knew he must think of some plan to delay them here. Suddenly he dropped to the ground and lay there as though insensible. With a run the Shuswaps gained the summit and surrounded him. He lay face downwards with his arms stretched out. They turned him over on his back and peered into his face. Not a muscle moved; not even his eyelids quivered. Then the chief bent over him and felt his heart. “He [is not dead], he said, “but the Great Spirit has called his spirit to go on a long journey. . . . Let us place his body under the pine-trees, there to await the return of the spirit.”



5 The Indians lifted the body of the young man, carried it to a clump of pine-trees and laid it down. Then they walked some yards away and held a council.

6 As soon as they were a safe distance away, the young man jumped up. He ran down the hill, and reaching the canoes, jumped into the unbroken one and began to paddle down the creek.

7 The Shuswaps turned and saw him. With fierce cries, they began to race down the hillside, and when they arrived at the spot where they had left their canoes, and saw what had happened, they filled the air with their angry yells. The young man was now out on the lake in the canoe, and they were unable to follow him, as all the other canoes were wrecked. They ran angrily along the lake shore, thinking he would land on their side, but instead, he made his way across the lake to the other side.

8 When the young man reached the shore, he again seized his tomahawk, and this time broke the canoe with which he had saved his life. The defeated Shuswaps, standing on the shore, saw him do this, and again they filled the air with their angry yells. There was nothing for them to do but to return to their camp, while the young man made his way along the lake shore to the village of his tribe. When he reached there, he found that he was no longer a man without a name. His brave deed had won for him the name of Kasamoldin—the canoe breaker—and ever afterwards in his tribe, and to others, he was known by this name.

Answer the questions. Mark your answers to questions 1–3 on the Answer Form to the right.

Answer Form

1 (A) (B) (C) (D)

2 (A) (B) (C) (D)

3 (A) (B) (C) (D)

**Number
Correct**

3

- 1** A central theme of this story is that great deeds arise from seeing how to best use our unique strengths and abilities. Which sentence from the story **best** illustrates this theme?
- A** “He had gone forth in battle, hoping to kill some powerful enemy, but no one had fallen under his tomahawk.”
- B** “Seizing his tomahawk, he began to break the canoes, and soon had a hole made in all of them except one.”
- C** “The Indians lifted the body of the young man, carried it to a clump of pine-trees and laid it down.”
- D** “There was nothing for them to do but to return to their camp, while the young man made his way along the lake shore to the village of his tribe.”



2 In what way does the plot contribute to the theme?

- A** The young man must decide on a name that reveals his special skills.
- B** The chief of the Shuswaps appreciates the young man for what he is.
- C** The young man doesn't give up until he proves he is a great warrior.
- D** The young man finally achieves success in a nontraditional way.

3 Which of the young man's character traits **best** helps to convey the theme?

- A** the courage he shows in a dangerous situation
- B** his physical strength in breaking the canoes
- C** his determination to earn a name for himself
- D** his fear when confronted by the Shuswaps

4 Explain how the author develops the theme over the course of "The Canoe Breaker." In your answer, include at least **two** details from different parts of the story.



Self Check

Go back and see what you can check off on the Self Check on page 52.

Read the passage. Then answer the questions that follow.

The Gift of the Flute

*a Brule Sioux legend
retold by Isabella Stroud*

1 Long ago, in the land of the Sioux, there was a time before the People had flutes. They had drums made of wood and animal hide, and rattles made of gourd; but they had no flutes, for they had never seen or heard one.

2 One day, a young hunter left his village to follow the fresh tracks of an elk. He carried with him a new wooden bow and a deerskin quiver holding arrows carved of wood, with fine feathers and flint stone arrowheads as sharp as glass. Into the mountains he followed the tracks of the elk, who remained always just out of sight, so that the hunter never caught a glimpse of him. The elk's tracks led deep into a forest—where, as night fell, both they and the elk disappeared.

3 As darkness filled the woods, the moon did not rise, and the hunter was forced to admit that until daybreak he was lost. He ate a little of the wasna—dried meat, mixed with berries and fat—that he carried in his deerskin pouch, and followed the sound of water to a cold stream, from which he drank. Then he wrapped himself in his fur robe and tried to sleep. But the night sounds of the forest were ones of animals calling, and owls hooting, and trees groaning, and instead of sleeping the hunter lay wakefully listening. The more he listened, the more he heard, until he realized that he was hearing a sound he had never heard before. It was a sound of wind—though not only of wind—and it was strangely lovely, yet dry and mournful, like the whistle of a ghost. And it was somewhat frightening. With a shiver, the hunter gathered his robe closer about him and took a long, long time to fall asleep.

4 When the hunter awoke with the sun, he looked up and saw wagnuka, the redheaded woodpecker, on a branch of the tree under which he had slept. The bird flitted to another tree, and to another, each time looking back as if to say, “Follow!” Again the hunter heard the lovely, strange sound of the night before, and he took up his bow and quiver and followed the woodpecker from tree to tree through the forest, until the bird came to a great cedar. There it paused on one hollow, slender branch, and began hammering with its beak at holes it had pecked in the wood. When the wind entered the holes the woodpecker had carved, the branch whistled with the lovely, strange sound. “Kola—friend,” said the hunter to the woodpecker, “permit me to take this branch back to my people!”

5 So the hunter returned to his village with no elk meat, but instead with the first flute: a gift of the tree, of the wind, of the bird, and of one who had learned how to listen.

Go On

6

This question has two parts. First, answer part A. Then, answer part B.

Part A

Which of the following sentences **best** states a central theme of the story?

- A** Taking time to understand nature can lead to rewarding friendships with plants and animals.
- B** It is generally better to settle for something unimportant than to leave empty-handed.
- C** If people remain motivated and focused, they can accomplish any goal that they set out to.
- D** If people are not too focused on what they think they want, they can find unexpected surprises.

Part B

Which sentence from the story **best** supports the answer to part A?

- A** "Into the mountains he followed the tracks of the elk, who remained always just out of sight, so that the hunter never caught a glimpse of him."
- B** "The more he listened, the more he heard, until he realized that he was hearing a sound he had never heard before."
- C** "When the hunter awoke with the sun, he looked up and saw wagnuka, the redheaded woodpecker, on a branch of the tree under which he had slept."
- D** "Again the hunter heard the lovely, strange sound of the night before, and he took up his bow and quiver and followed the woodpecker from tree to tree through the forest, until the bird came to a great cedar."
- E** "So the hunter returned to his village with no elk meat, but instead with the first flute: a gift of the tree, of the wind, of the bird, and of one who had learned how to listen."

- 7** Which sentence from the story **best** explains why the hunter has to stay in the woods overnight?
- A** "One day, a young hunter left his village to follow the fresh tracks of an elk."
 - B** "Into the mountains he followed the tracks of the elk, who remained always just out of sight, so that the hunter never caught a glimpse of him."
 - C** "As darkness filled the woods, the moon did not rise, and the hunter was forced to admit that until daybreak he was lost."
 - D** "But the night sounds of the forest were ones of animals calling, and owls hooting, and trees groaning, and instead of sleeping the hunter lay wakefully listening."

8 Based on evidence from the text, which words below **best** describe the hunter? Select all that apply.

- A** curious
- B** cold-hearted
- C** respectful
- D** foolhardy
- E** careful
- F** cheerful

9 The author begins the fourth paragraph with the words "When the hunter awoke with the sun." How does this choice of words affect the tone of the story?

- A** The words further develop the frightening tone because the hunter is too scared to notice the sun.
- B** The words create a surprising tone because the reader expected the hunter to sleep into the afternoon.
- C** The words create a light tone to contrast with the mysterious tone of the previous paragraph.
- D** The words create a humorous tone because the hunter is now amused by his fear.

Go On

10 Which of these **best** summarizes the plot of this story?

- A** A Sioux hunter follows an elk into a forest. The elk stays too far ahead of him, so the hunter loses sight of the elk. The hunter decides to stay the night in the forest and look for the elk in the morning. When he wakes up, the hunter cannot find the elk. The hunter walks home and finds a flute on the way. He plays it for his people.
- B** A Sioux hunter follows an elk into a forest, and then night falls. Realizing it's too dark to get home, he lies down and listens to the sounds of the forest. He hears an unusual sound, and in the morning, he follows it to find a woodpecker who makes a flute. With permission from the woodpecker, the hunter takes the gift to his people.
- C** A Sioux hunter foolishly follows an elk into the forest. He lies down to fall asleep but is kept awake all night by the sounds of animals and trees. He also hears an unusual sound which frightens him because he is a coward. When he wakes up in the morning, he sees a woodpecker putting holes in some trees. This gives him an idea to make a flute.
- D** A Sioux hunter follows an elk into a forest until it gets dark. Then, he stays the night in the forest but is too worried about finding the elk to get any sleep. He hears the wind, the trees, and the animals of the forest. All the noises are very loud and frighten the hunter. He is given a flute on the way home.

11 Below are three inferences about the passage.

| | |
|------------------|---|
| Inference | The people of the story placed a high value on music. |
| | The hunter is in tune with the nature surrounding him. |
| | For the hunter, the flute's sound carries deep emotion. |

Circle one of the inferences. Then cite two lines from the passage that help support this inference.

Line 1: _____

Line 2: _____

A student is writing a report about Christopher Columbus. Read the following paragraphs from two of the student's sources. Then answer the questions that follow.

Article 1

Christopher Columbus was one of the most brilliant navigators in history. In 1492, he “sailed the ocean blue,” heading west from Spain and into the unknown. On October 12, he sighted land in the Caribbean Sea. He didn't know it at the time, but he had discovered a part of the world Europeans did not know existed. He created a small settlement and then, on a second voyage in 1494, founded a Spanish colony. Four years later, he sailed south, exploring the northern coast of South America. Most importantly, Columbus found a reliable sailing route from Europe to America. He did what no man before him had done, and so changed the world forever.

Article 2

Christopher Columbus changed the world—for the worse. The consequence of his adventures was the deaths of millions of men, women, and children living in the Americas. How did this happen? Before Columbus, Europe and the Americas had long been separated. There had been no contact of any kind for hundreds of thousands of years. Then Columbus and his followers arrived. They brought with them new people, new plants and animals, and new diseases. This so-called Columbian Exchange led to 95 percent of all Native Americans living in Central and South America dying of disease. And those who did not die of disease were made slaves by men like Columbus. Columbus knew how to sail, but his skills brought only disaster.

35 Which is the best summary of Article 1?

- A** Christopher Columbus was a great navigator both for discovering America and finding a sailing route from Europe.
- B** Christopher Columbus created a small settlement in the Caribbean and sailed around the northern coast of South America.
- C** Christopher Columbus changed the world by making several voyages and establishing a Spanish colony.
- D** Christopher Columbus was the first man to discover a way of sailing easily from Europe to the Americas.
- E** Christopher Columbus was important because, in sailing to America, he discovered an unknown part of the world.

36

Which statement from Article 2 could the student quote to explain the meaning of “Columbian Exchange”?

- A** “Before Columbus, Europe and the Americas had long been separated.”
- B** “There had been no contact of any kind for hundreds of thousands of years.”
- C** “They brought with them new people, new plants and animals, and new diseases.”
- D** “And those who did not die of disease were made slaves by men like Columbus.”

37

Article 1 is organized sequentially, and Article 2 has a cause-effect organization. How can the student explain why those structures are appropriate for the arguments the authors are making?

STOP

Applying Properties for Powers with the Same Base

► Rewrite each expression as a single power.

1 $6^4 \cdot 6^4$

2 $(-5^5)^2$

3 $\frac{2^9}{2^5}$

4 $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3^2$

5 $\frac{12^5 \cdot 12^7}{-12^4}$

6 $\left(\frac{7^5}{7^2}\right)^2$

► Evaluate each expression.

7 $\frac{4^8}{4^5}$

8 $(-10) \cdot (-10)^4$

9 $\left(\frac{(-3)^4}{(-3)^2}\right)^3$

► What value of x makes the equation true?

10 $\frac{8^x}{8^5} = 8^7$

11 $(-11)^x \cdot (-11)^4 = \frac{(-11)^{10}}{(-11)^3}$

12 $(6^x)^{10} = \frac{(6^{12})^2}{6^4}$

13 Explain how you solved for x in problem 12.

Applying Properties for Powers with the Same Exponent

► Rewrite each expression as a single power.

1 $9^4 \cdot 10^4$

2 $(12 \cdot 6)^3$

3 $\frac{3^3}{2^3}$

4 $\frac{6^2}{2^2}$

5 $(-5)^6 \cdot (-7)^6$

6 $\left(\frac{6^4}{12^4}\right)^2$

► Rewrite each expression as a product of two powers or quotient of two powers.

7 $5^5(16^2 \cdot 5^3)^3$

8 $\left(\frac{8^4 \cdot 5^3}{8^5}\right)^2$

9 $\left(\frac{5^8 \cdot 3^7}{5^4}\right)^{10}$

10 How does multiplying powers with the same base differ from multiplying powers with the same exponent but different bases?

Applying Properties of Negative Exponents

► Rewrite each expression using only positive exponents. The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.

1 $7^3 \cdot 16^{-9}$

2 $\frac{8^{-6}}{21^{-4}}$

3 $\left(\frac{7}{16}\right)^{-3}$

4 $16^3 \cdot (-7)^{-3}$

5 $(8 \cdot 21)^{-4}$

6 $8 \cdot 21^{-3}$

7 $\frac{11^{-7} \cdot 5^9}{6^9}$

8 $\frac{11^{-7} \cdot 5^9}{6^{-9}}$

9 $6^9 \cdot 11^{-7} \cdot 5^{-9}$

10 $\frac{3^5 \cdot (-4)^{-10}}{7^9 \cdot 21^{-4}}$

11 $\frac{(-21)^{-4} \cdot (-4)^0}{3^{-5} \cdot 7^{-9}}$

12 $\left(\frac{3}{7}\right)^{-5} \cdot (-21)^{-4} \cdot (-4)^2$

Answers

$$\frac{1}{(8 \cdot 21)^4}$$

$$\frac{6^9}{11^7 \cdot 5^9}$$

$$\frac{16^3}{7^3}$$

$$\frac{7^5 \cdot (-4)^2}{3^5 \cdot (-21)^4}$$

$$\frac{21^4}{8^6}$$

$$\frac{6^9 \cdot 5^9}{11^7}$$

$$\frac{16^3}{(-7)^3}$$

$$\frac{3^5 \cdot 21^4}{7^9 \cdot (-4)^{10}}$$

$$\frac{3^5 \cdot 7^2}{(-21)^4}$$

$$\frac{8}{21^3}$$

$$\frac{5^9}{11^7 \cdot 6^9}$$

$$\frac{7^3}{16^9}$$

Applying Properties of Integer Exponents

► Evaluate each expression.

1 $18^{-4} \cdot 6^7$

2 $3^4 \cdot 3^{-6} \cdot 9^0$

3 $\left(\frac{3^{-4} \cdot 3^6}{6^3 \cdot 6^{-1}}\right)^{-2}$

► Write each expression using only positive exponents.

4 $19^{-3} \cdot 19 \cdot 19^{-4} \cdot 19^3$

5 $\frac{6^{-3} \cdot 17^3 \cdot 2}{6^5 \cdot 17^{-4} \cdot 2^{-1}}$

6 $24^{-3} \cdot 24^7 \cdot (24^{-3})^4 \cdot 24^9$

7 $\left(\frac{7^{-3} \cdot 3^{-8}}{7^{-2} \cdot 3^{-2}}\right)^{-4}$

8 $(2^{-1} \cdot 3^0)^{-3} \cdot (2^0 \cdot 5^3)^5$

9 $\left(\frac{5^6 \cdot 3^{-3}}{3^{-3}}\right)^4$

10 How could you have simplified problem 7 in a different way?

Writing Numbers in Scientific Notation

► Write each number in scientific notation.

1 8

2 54

3 0.02

4 229

5 187

6 0.452

7 0.006009

8 452

9 35,710

10 0.00005026

11 787,000

12 45.2

13 $934\frac{1}{2}$

14 0.000000452

15 11,235,000,000

16 How are the answers to problems 6, 8, 12, and 14 similar? How are they different?

Adding and Subtracting with Scientific Notation

► Find each sum or difference. Write your answer in scientific notation.

1 $(6 \times 10^0) + (9 \times 10^1)$

2 $32 - (2.1 \times 10^1)$

3 $(7 \times 10^0) + (3 \times 10^1)$

4 $100 - (1.4 \times 10^1)$

5 $(8.8 \times 10^2) + (3 \times 10^2)$

6 $(3.05 \times 10^2) + 64$

Adding and Subtracting with Scientific Notation *continued*

7 $(4 \times 10^2) + 120.5$

8 $(2.75 \times 10^3) - 100$

9 $(9.5 \times 10^2) - (4.3 \times 10^1)$

10 $18 - (2 \times 10^{-1})$

11 $0.071 + (6 \times 10^{-2})$

12 $2,000 + (8 \times 10^3)$

13 When adding or subtracting with scientific notation, why is it important to have the same power of 10?

Multiplying and Dividing with Scientific Notation

► Find each product or quotient. Write your answer in scientific notation.

1 $(3.6 \times 10^1) \div 6$

2 $(2 \times 10^2) \times (3 \times 10^1)$

3 $7 \times (2 \times 10^1)$

4 $(2.5 \times 10^0) \times (1.5 \times 10^1)$

5 $(4 \times 10^2) \div (4 \times 10^1)$

6 $45 \div (5 \times 10^0)$

Multiplying and Dividing with Scientific Notation

continued

7 $(2.5 \times 10^2) \times 5$

8 $900 \div (4.5 \times 10^0)$

9 $(4 \times 10^5) \times 0.0375$

10 $(6 \times 10^{-10}) \div (2.5 \times 10^{-12})$

11 $(2.8 \times 10^{-7}) \times (7 \times 10^{12})$

12 $0.000068 \div (2 \times 10^8)$

13 How do you divide two numbers in scientific notation?

Name _____ **The Great Depression**

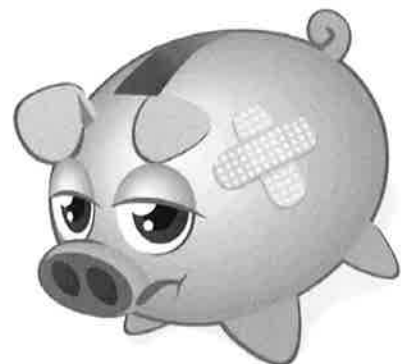
The Great Depression

The Great Depression began with the stock market crash in October, 1929. By 1933, the value of the stock market had sunk to only 10% of what it had been. About 11,000 banks failed. Back then there was no government guarantee that people would not lose money they had deposited in banks, so between the stock market failure and the bank crashes, many people were left penniless. About 300,000 businesses went out of business. Many people lost their jobs. When people were unable to pay their rents or mortgages, they lost their homes. From 1929 to 1933, the unemployment rate rose from 3% to 25%. Family incomes declined by almost half.

At the start of the Great Depression, Herbert Hoover was president, and many people blamed him for what happened. The crudely-built neighborhoods on the outskirts of cities where many people lived after they lost their homes were nicknamed "Hoovervilles." In 1933, at the height of the Great Depression, Franklin D. Roosevelt was elected president. Roosevelt's plan to turn around the economy was called the "New Deal."

The New Deal created around 100 new government offices and 40 new agencies. The laws put into place during this time put new regulations in place on the stock market, banks, and businesses. Programs were set up to help people get back to work, as well as to make sure people received food and housing. Some of these programs, like the Social Security Act, still exist today. In all, 15 major laws were enacted during Roosevelt's "First Hundred Days" of office.

The Great Depression was ended by World War II, when a wartime economy provided new opportunities for people to go back to work.



Name _____ **The Great Depression**

QUESTIONS: The Great Depression

Circle the correct answer.

1. Which event set the Great Depression into motion?
 - A. the New Deal
 - B. the Stock Market Crash
 - C. the Social Security Act
 - D. World War II

2. Which of the following is NOT an even contributing to the Great Depression?
 - A. banks failing
 - B. unemployment
 - C. social security
 - D. business going out of business

3. Who created the New Deal?
 - A. President Herbert Hoover
 - B. President Theodore Roosevelt
 - C. President Franklin D. Roosevelt
 - D. none of the above

4. Which of the following was NOT a result of the New Deal?
 - A. the Social Security Act
 - B. the First Hundred Days
 - C. new regulations on the Stock Market
 - D. programs to get people back to work

5. Which event marks the end of the Great Depression?
 - A. the New Deal
 - B. the Stock Market Crash
 - C. the Social Security Act
 - D. World War II

8th Grade
SUSD Education Continuity Plan
Instructional Materials

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34 Characteristics of Waves

Lesson Objectives

- Define mechanical wave.
- Describe transverse waves.
- Identify longitudinal waves.
- Describe surface waves.

Lesson Vocabulary

- longitudinal wave
- mechanical wave
- surface wave
- transverse wave

Introduction

Ocean waves are among the most impressive waves in the world. They clearly show that waves transfer energy. In the case of ocean waves, energy is transferred through matter. But some waves, called electromagnetic waves, can transfer energy without traveling through matter. These waves can travel through space. You can read more about electromagnetic waves in the chapter "Electromagnetic Radiation." Waves that transfer energy through matter are the focus of the present chapter. These waves are called mechanical waves.

Mechanical Waves

A **mechanical wave** is a disturbance in matter that transfers energy from place to place. A mechanical wave starts when matter is disturbed. An example of a mechanical wave is pictured in **Figure 34.1**. A drop of water falls into a pond. This disturbs the water in the pond. What happens next? The disturbance travels outward from the drop in all directions. This is the wave. A source of energy is needed to start a mechanical wave. In this case, the energy comes from the falling drop of water.



FIGURE 34.1

A drop of water causes a disturbance that travels through the pond as a wave.

The Medium

The energy of a mechanical wave can travel only through matter. This matter is called the medium (*plural, media*). The medium in **Figure 34.1** is a liquid — the water in the pond. But the medium of a mechanical wave can be any state of matter, including a solid or a gas. It's important to note that particles of matter in the medium don't actually travel along with the wave. Only the energy travels. The particles of the medium just vibrate, or move back-and-forth or up-and-down in one spot, always returning to their original positions. As the particles vibrate, they pass the energy of the disturbance to the particles next to them, which pass the energy to the particles next to them, and so on.

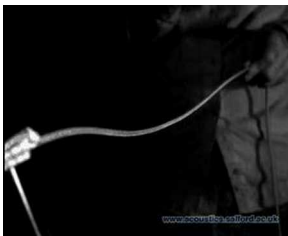
Types of Mechanical Waves

There are three types of mechanical waves. They differ in how they travel through a medium. The three types are transverse, longitudinal, and surface waves. All three types are described in detail below.

Transverse Waves

A **transverse wave** is a wave in which the medium vibrates at right angles to the direction that the wave travels. An example of a transverse wave is a wave in a rope, like the one pictured in **Figure 34.2**. In this wave, energy is provided by a person's hand moving one end of the rope up and down. The direction of the wave is down the length of the rope away from the person's hand. The rope itself moves up and down as the wave passes through it. You can see a brief video of a transverse wave in a rope at this URL: <http://www.youtube.com/watch?v=TZIr9mpERbU> .

To see a transverse wave in slow motion, go to this URL: <http://www.youtube.com/watch?v=g49mahYeNgc> (0:22).



MEDIA

Click image to the left or use the URL below.

URL: <http://www.ck12.org/flx/render/embeddedobject/5034>

Crests and Troughs

A transverse wave can be characterized by the high and low points reached by particles of the medium as the wave passes through. This is illustrated in **Figure 34.3**. The high points are called crests, and the low points are called troughs.

S Waves

Another example of transverse waves occurs with earthquakes. The disturbance that causes an earthquake sends transverse waves through underground rocks in all directions from the disturbance. Earthquake waves that travel this way are called secondary, or S, waves. An S wave is illustrated in **Figure 34.4**.

Transverse Wave in a Rope

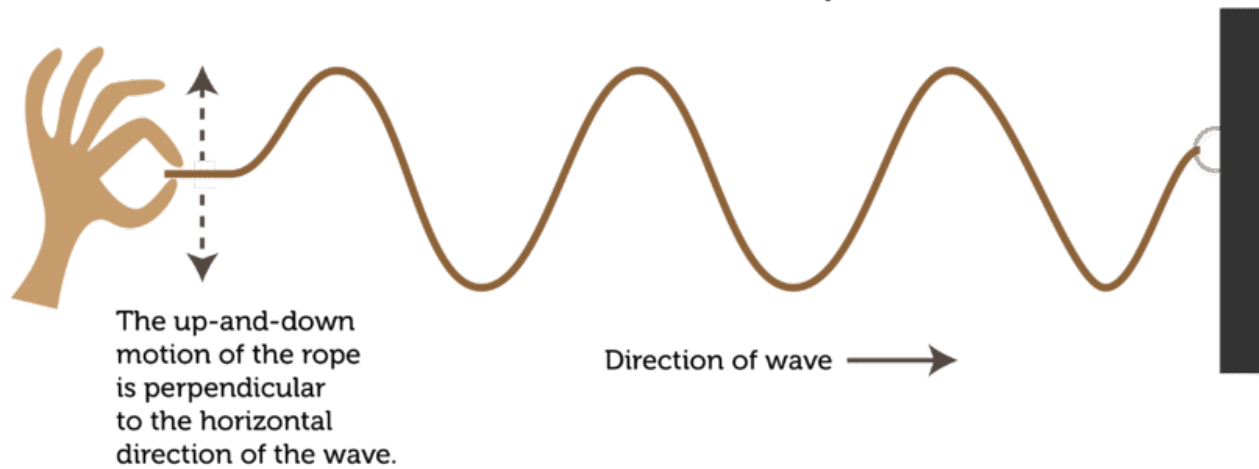


FIGURE 34.2

In a transverse wave, the medium moves at right angles to the direction of the wave.

Parts of a Transverse Wave

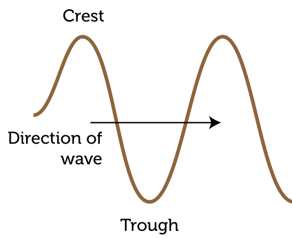


FIGURE 34.3

Crests and troughs are the high and low points of a transverse wave.

Motion of rock

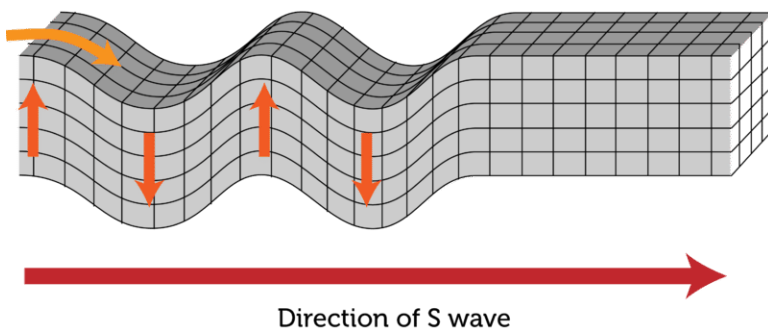


FIGURE 34.4

An S wave is a transverse wave that travels through rocks under Earth's surface.

Longitudinal Waves

A **longitudinal wave** is a wave in which the medium vibrates in the same direction that the wave travels. An example of a longitudinal wave is a wave in a spring, like the one in **Figure 34.5**. In this wave, the energy is provided by a person's hand pushing and pulling the spring. The coils of the spring first crowd closer together and then spread farther apart as the disturbance passes through them. The direction of the wave is down the length of the spring, or the same direction in which the coils move. You can see a video of a longitudinal wave in a spring at this URL: <http://www.youtube.com/watch?v=ubRlaCCQfDk> .

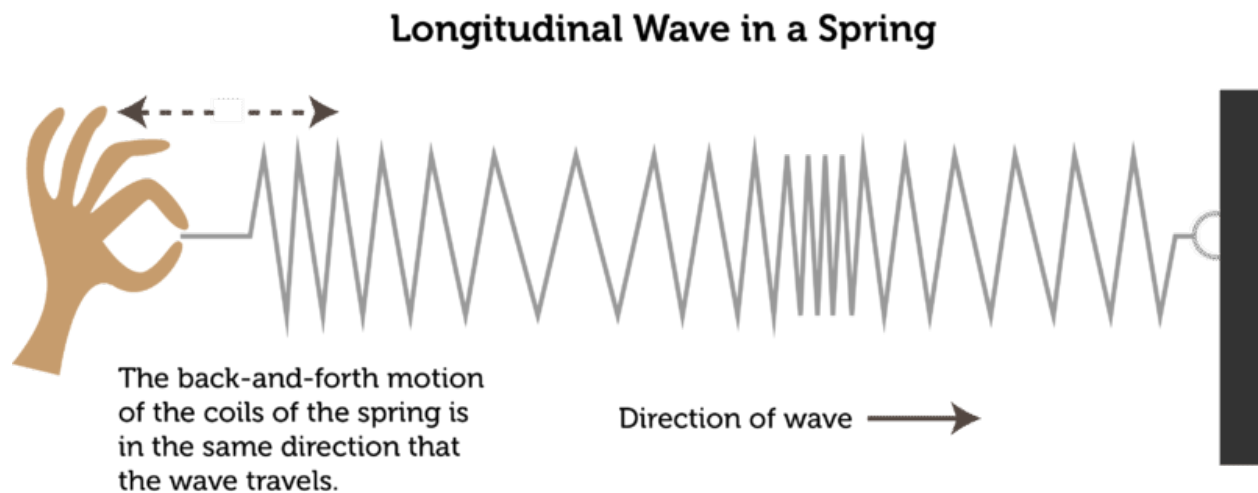


FIGURE 34.5

In a longitudinal wave, the medium moves back and forth in the same direction as the wave.

Compressions and Rarefactions

A longitudinal wave can be characterized by the compressions and rarefactions of the medium. This is illustrated in **Figure 34.6**. Compressions are the places where the coils are crowded together, and rarefactions are the places where the coils are spread apart.

P Waves

Earthquakes cause longitudinal waves as well as transverse waves. The disturbance that causes an earthquake sends longitudinal waves through underground rocks in all directions from the disturbance. Earthquake waves that travel this way are called primary, or P, waves. They are illustrated in **Figure 34.7**.

Surface Waves

A **surface wave** is a wave that travels along the surface of a medium. It combines a transverse wave and a longitudinal wave. Ocean waves are surface waves. They travel on the surface of the water between the ocean and the air. In

Parts of a Longitudinal Wave

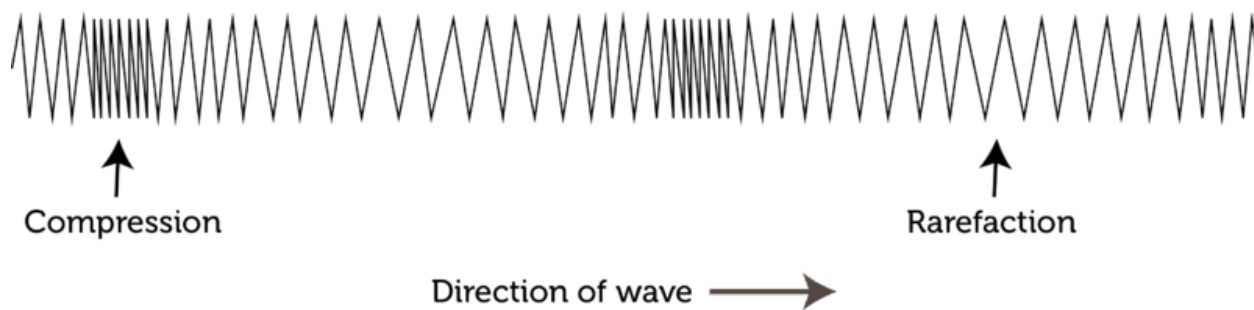


FIGURE 34.6

The compressions and rarefactions of a longitudinal wave are like the crests and troughs of a transverse wave.

P Waves

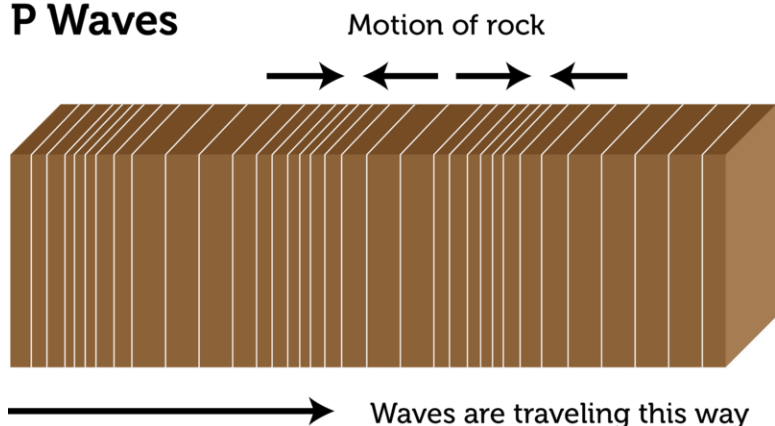
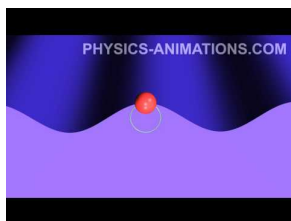


FIGURE 34.7

P waves are longitudinal waves that travel through rocks under Earth's surface.

a surface wave, particles of the medium move up and down as well as back and forth. This gives them an overall circular motion. This is illustrated in **Figure 34.8** and at the URL below.

<http://www.youtube.com/watch?v=7yPTa8qi5X8> (0:57)



MEDIA

Click image to the left or use the URL below.

URL: <http://www.ck12.org/flx/render/embeddedobject/5035>

In deep water, particles of water just move in circles. They don't actually move closer to shore with the energy of the waves. However, near the shore where the water is shallow, the waves behave differently. They start to drag on the bottom, creating friction (see **Figure 34.9**). The friction slows down the bottoms of the waves, while the tops of

How Particles Move in a Surface Wave

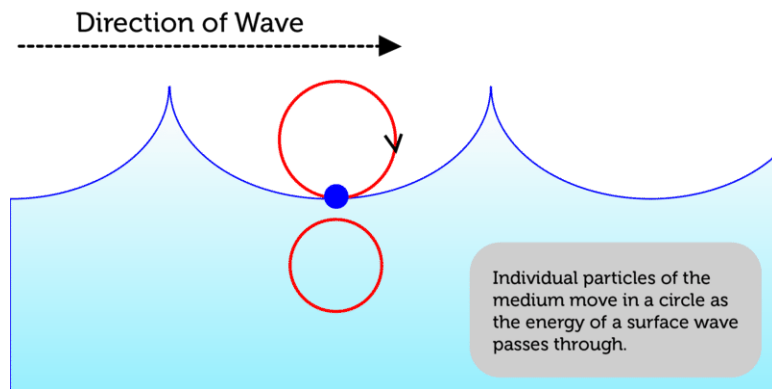


FIGURE 34.8

Surface waves are both transverse and longitudinal waves.

the waves keep moving at the same speed. This causes the waves to get steeper until they topple over and crash on the shore. The crashing waves carry water onto the shore as surf.

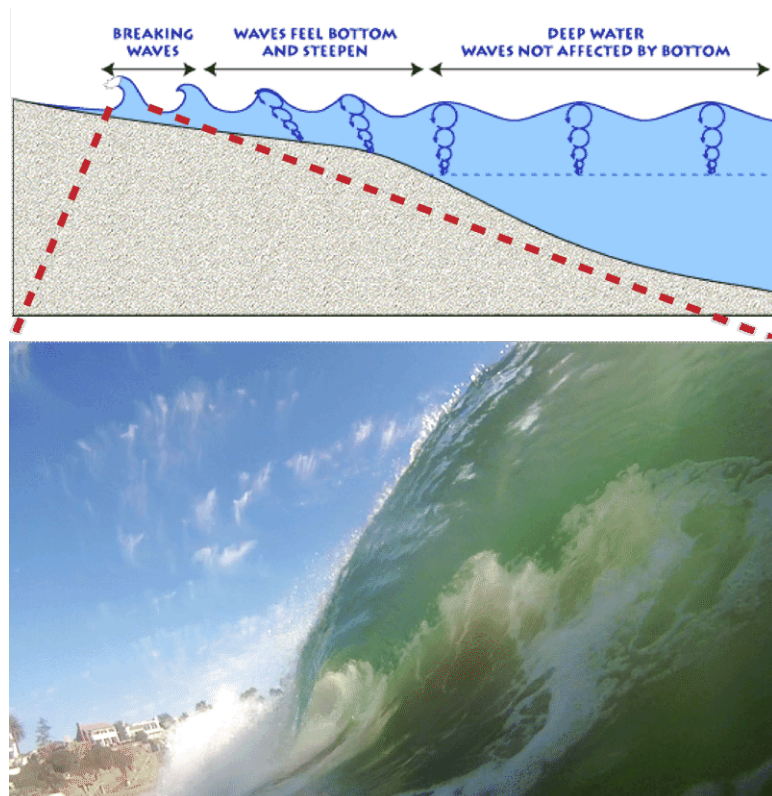


FIGURE 34.9

Waves topple over and break on the shore because of friction with the bottom in shallow water.

Lesson Summary

- Mechanical waves are waves that transfer energy through matter, called the medium. Mechanical waves start when a source of energy causes a disturbance in the medium. Types of mechanical waves include transverse, longitudinal, and surface waves.
- In a transverse wave, such as a wave in a rope, the medium vibrates at right angles to the direction that the wave travels. The high points of transverse waves are called crests, and the low points are called troughs.
- In a longitudinal wave, such as a wave in a spring, the medium vibrates in the same direction that the wave travels. Places where the particles of the medium are closer together are called compressions, and places where they are farther apart are called rarefactions.
- A surface wave, such as an ocean wave, travels along the surface of a medium and combines a transverse wave and a longitudinal wave. Particles of the medium move in a circle as the surface wave passes through them.

Lesson Review Questions

Recall

1. What is a mechanical wave?
2. Identify the medium of the wave in **Figure 34.1**.
3. Describe the compressions and rarefactions of a longitudinal wave.
4. What are surface waves? Give an example.
5. State how a particle of the medium moves when a surface wave passes through it.

Apply Concepts

6. Draw a sketch of a transverse wave. Label the crests and troughs, and add an arrow to show the direction the wave is traveling.

Think Critically

7. Compare and contrast P waves and S waves of earthquakes.

Points to Consider

When an earthquake occurs under the ocean, it sends waves through the water as well as the ground. When the energy of the earthquake reaches shore, it forms a huge wave called a tsunami.

- Do you know how large tsunamis are? How might the size of these and other waves be measured?
- What causes some waves to be bigger than others?