

Characteristics of Waves ▪ Guided Reading and Study

# Seismic Waves (pp. 530-533)

This section explains how earthquakes produce waves that move through Earth.

## Use Target Reading Skills

As you read the section, note the definition of each key term. Also note other details in the paragraph that contains the definition. Then use all the information to write a sentence using the key term.

a. seismic wave

A wave produced by an earthquake.

b. P wave

Longitudinal Seismic Wave

c. S wave

Transverse Seismic Wave

d. surface wave

A combination of a longitudinal wave & transverse wave and it travels on surface of medium.

e. tsunami

Huge Surface Wave on ocean caused by underwater

f. seismograph

Instrument used to detect <sup>Earthquake</sup> and measure earthquake waves

## Types of Seismic Waves (pp. 531-532)

1. What happens when stress in rock builds up inside Earth?

When stress in rock builds up the rock breaks, releasing energy.

2. The waves produced by earthquakes are known as

seismic.

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**Seismic Waves** (continued)

3. Circle the letter of each sentence that is true about seismic waves.

- a. Some seismic waves are longitudinal.
- b. Seismic waves do not carry energy.
- c. There is only one type of seismic wave.
- d. Seismic waves ripple out in all directions from the point where the earthquake occurred.

4. Why can't S waves travel through Earth's core?

S waves can't travel through liquid.

5. Which type of seismic waves arrives at distant points before any other seismic waves? P-waves

6. Which type of seismic waves produces the most severe ground movements? Surface waves

7. Which type of seismic waves cannot be detected on the side of Earth opposite an earthquake? S-waves

8. What are tsunamis?

Huge surface waves

9. Complete the table about seismic waves.

Seismic Waves		
Type of Seismic Wave	Transverse or Longitudinal?	Travel Characteristics
a. <u>P waves</u>	b. <u>Longitudinal</u>	Travel through all parts of Earth
S waves	c. <u>Transverse</u>	Travel through Earth but not through d. <u>core</u>
e. <u>Surface waves</u>	f. <del>Surface</del> <u>Combo</u>	Travel only along Earth's g. <u>Surface</u>

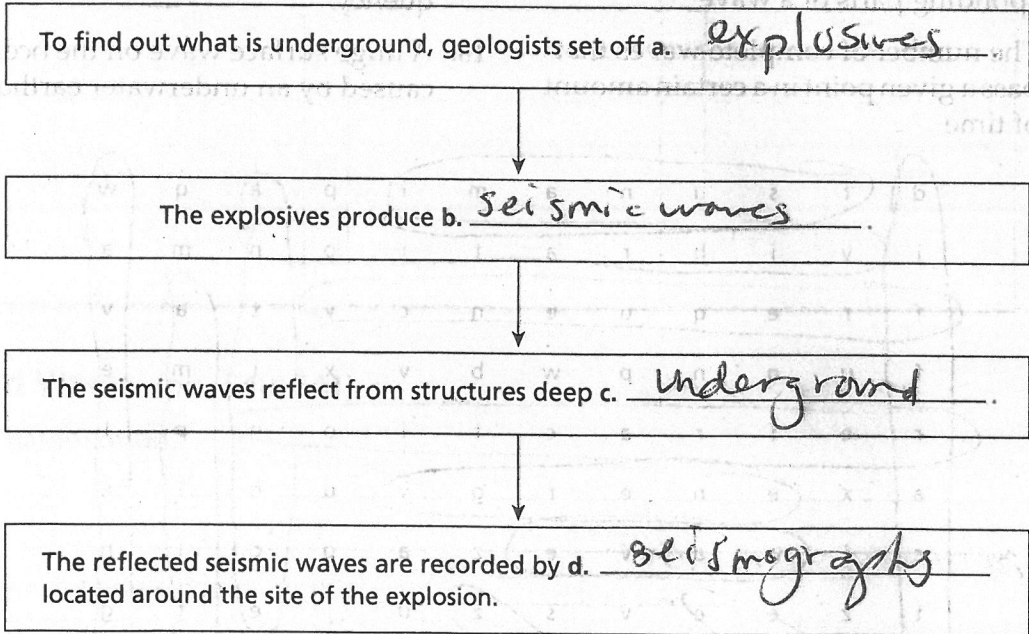
**Detecting Seismic Waves** (p. 533)

10. Circle the letter of the instrument scientists use to detect earthquakes.

- a. rarefactions
- b. telegraphs
- c. seismographs
- d. tsunamis

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- 11. What does a seismograph record?  
Records ground movements
- 12. What is the frame of a seismograph attached to?  
Ground
- 13. What happens to a seismograph's frame when seismic waves arrive?  
It shakes
- 14. How can scientists tell how far away an earthquake was from a seismograph?  
By measuring the time between arrival of the P waves and the arrival of the S-waves.
- 15. How can scientists tell where an earthquake occurred?  
By comparing readings from at least 3 seismographs at different places on Earth
- 16. Complete the flowchart about how geologists locate valuable substances under Earth's surface.



**Characteristics of Waves** ▪ **Key Terms**

**Key Terms**

The block of letters below contains 16 key terms from the chapter. You might find them across, down, or on the diagonal. Use the clues to identify the terms you need to find. Circle each of the terms in the block of letters.

**Clues**

- |  |   |
|--|---|
| 1. A disturbance that transfers energy from place to place   | 10. The unit in which wave frequency is measured  |
| 2. The ability to do work  | 11. The bending of waves due to a change of speed as waves enter a new medium at an angle |
| 3. The material through which a wave travels   | 12. The bending and spreading out of waves around the edge of a barrier and spreading out |
| 4. A repeated back-and-forth or up-and-down motion   | 13. A point of zero amplitude on a standing wave  |
| 5. The highest part of a transverse wave   | 14. A point of maximum amplitude on a standing wave                                       |
| 6. The lowest part of a transverse wave  | 15. What occurs when external vibrations match an object's natural frequency              |
| 7. The maximum distance the particles of the medium carrying the wave move away from their rest position | 16. A huge surface wave on the ocean caused by an underwater earthquake                   |
| 8. The distance between two corresponding parts of a wave  |   |
| 9. The number of complete waves that pass a given point in a certain amount of time                      |   |

A 10x10 grid of letters with several words circled in black:

d	t	s	u	n	a	m	i	p	a	q	w
i	v	i	b	r	a	t	i	o	n	m	a
f	r	e	q	u	e	n	c	y	t	a	v
f	u	n	n	p	w	b	v	x	i	m	e
r	e	f	r	a	c	t	i	o	n	p	l
a	x	e	n	e	r	g	y	u	o	l	e
c	i	w	a	v	e	z	a	p	d	i	n
t	z	e	e	v	s	z	u	j	e	t	g
i	o	d	d	e	t	x	w	e	g	u	t
o	o	u	t	r	o	u	g	h	y	d	h
n	i	r	e	s	o	n	a	n	c	e	r
n	y	h	m	e	d	i	u	m	r	t	z