

Earthquakes ▪ *Guided Reading and Study***Forces in Earth's Crust**

This section explains how stresses in Earth's crust cause breaks, or faults, in the crust. The section also explains how faults and folds in Earth's crust form mountains.

Use Target Reading Skills

The first column in the chart lists key terms in this section. In the second column, write what you know about the key term. As you read the section, write a definition of the key term in your own words in the third column. Some examples are done for you.

Key Term	What You Know	Definition
Stress		
Tension	pulling, as on a rope	
Compression	squeezing together	
Shearing		
Normal fault		A fault in which one part of the rock is above another part and slips downward when movement occurs
Hanging wall		
Footwall		
Reverse fault		
Strike-slip fault		
Anticline	<i>anti</i> means "against"	
Syncline		
Plateau	flat land feature	

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Forces in Earth's Crust *(continued)*

1. Circle the letter of the term that refers to force that acts on rock to change its shape or volume.
 a. fault b. stress c. pressure d. heat
2. The amount of space a rock takes up is its _____.

Types of Stress

3. List the three types of stress that occur in Earth's crust.
 a. _____ b. _____ c. _____
4. Complete the cause-events-effect chart to show how the different types of stress change the shape and volume of rock.

Cause	Event	Effect
Tension	c.	e.
a.	d.	Rock folds or breaks
b.	Pushes rock in two different directions	f.

g. Which type of stress causes the crust to become thinner?

5. A break in Earth's crust is a(n) _____.

Kinds of Faults

Match the kind of fault with its description.

Type of Fault

- ___ 6. strike-slip fault
- ___ 7. normal fault
- ___ 8. reverse fault

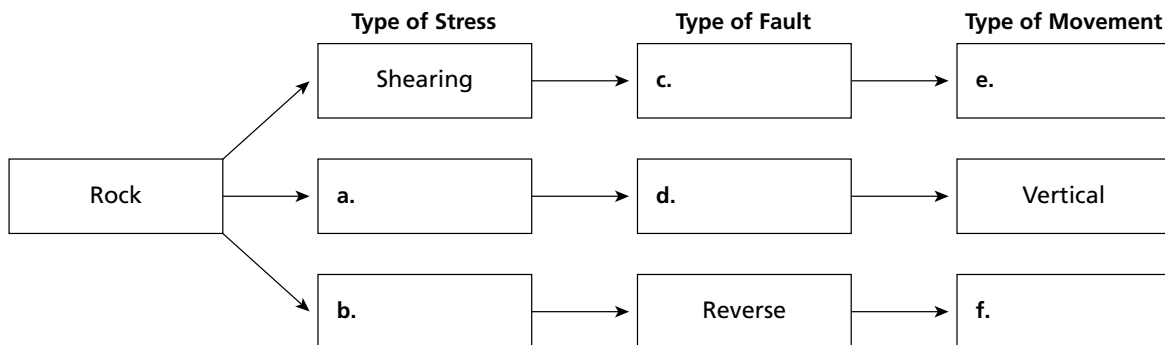
Description

- a. The hanging wall slides up and over the footwall.
- b. There is little up-or-down motion.
- c. The hanging wall slips downward below the footwall.

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9. Is the following sentence true or false? A strike-slip fault that forms the boundary between two plates is called a convergent boundary.

10. Circle the letter of each sentence that is true about a hanging wall.
- a. It slips downward when movement occurs along a normal fault.
 - b. It is the half of a fault that lies below in a reverse fault.
 - c. It is the same as a footwall.
 - d. It occurs when the fault is at an angle.
11. Circle the letter of each sentence that is true about both normal and reverse faults.
- a. The faults are at an angle.
 - b. The faults are caused by tension.
 - c. The faults are caused by compression.
 - d. The faults have footwalls.
12. Complete the flowchart to show the types of faults and movements caused by stress on rock.



g. Two types of faults can result in mountains. Which are they, and how do you know from examining this flowchart? _____

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Forces in Earth's Crust *(continued)*

Match the landform with the type of fault or faults found there.

Landform

- ___ 13. San Andreas Fault
- ___ 14. Rio Grande rift valley
- ___ 15. Rocky Mountains

Type of Fault

- a. reverse fault
- b. strike-slip fault
- c. normal fault

Match the term with its definition.

Term

- ___ 16. anticline
- ___ 17. syncline
- ___ 18. folded mountains

Definition

- a. Fold in rock that bends upward
- b. Parallel ridges and valleys
- c. Fold in rock that bends downward

Changing Earth's Surface

19. Circle the letter of the sentence that describes how a fault-block mountain is created.
- a. It is created by two normal faults.
 - b. It is created by two reverse faults.
 - c. It is created by a strike-slip fault.
 - d. It is created by shearing.
20. Circle the letter of each mountain range that was caused by folding.
- a. Alps
 - b. Himalayas
 - c. Appalachian
 - d. Great Basin
21. What is a plateau? _____
- _____

Earthquakes ▪ *Review and Reinforce*

Forces in Earth's Crust

Understanding Main Ideas

Use the diagrams below to answer items 1–3.

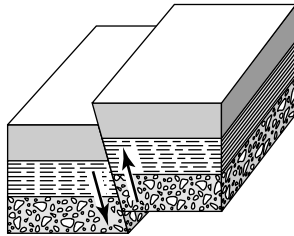


Diagram A

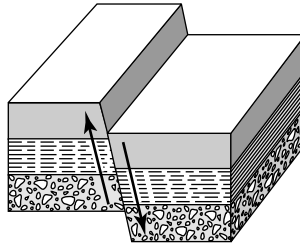


Diagram B

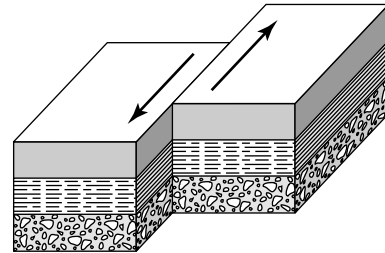


Diagram C

1. Diagram A

- a. Type of Fault: _____
- b. Stress Force: _____
- c. Movement Along Fault: _____

2. Diagram B

- a. Type of Fault: _____
- b. Stress Force: _____
- c. Movement Along Fault: _____

3. Diagram C

- a. Type of Fault: _____
- b. Stress Force: _____
- c. Movement Along Fault: _____

Building Vocabulary

Write a definition for each of these words. Use the back of this sheet if you need more space.

- 4. shearing _____
- 5. hanging wall _____
- 6. syncline _____
- 7. footwall _____
- 8. stress _____
- 9. anticline _____
- 10. plateau _____



Earthquakes ▪ *Guided Reading and Study*

Earthquakes and Seismic Waves

This section explains how energy from an earthquake travels through Earth, how it can be detected, and how the size of an earthquake can be measured.

Use Target Reading Skills

As you read about seismic waves, complete the graphic organizer by filling in the details.

Main Idea		
Seismic waves carry the energy of an earthquake.		
Detail	Detail	Detail
a.	b.	c.



Introduction

1. The point at which a rock under stress breaks and triggers an earthquake is called the _____.
2. The point on the surface directly above the focus is the _____.

Types of Seismic Waves

3. What are seismic waves? _____

Earthquakes ▪ *Guided Reading and Study*

Earthquakes and Seismic Waves *(continued)*

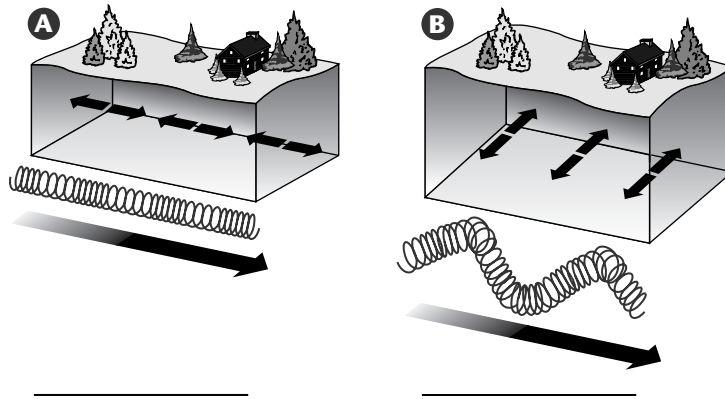
4. Is the following sentence true or false? Seismic waves carry the energy of an earthquake away from the focus in all directions.

_____.

5. Circle the letter of each term that is a category of seismic wave.

- a. P wave
- b. S wave
- c. surface wave
- d. underground wave

6. Label each drawing as *S Waves* or *P Waves*.



7. Is the following sentence true or false? Surface waves move more quickly than P waves and S waves. _____

Type of Wave

- ___ 8. P wave
- ___ 9. S wave
- ___ 10. Surface wave

Effect

- a. shakes buildings from side to side
- b. shakes buildings violently
- c. causes buildings to contract and expand

11. A device that records the ground movements caused by seismic waves is a(n) _____.

Earthquakes ▪ *Guided Reading and Study*

Measuring Earthquakes

12. List the three scales that are used for measuring earthquakes.

- a. _____
- b. _____
- c. _____

13. In your own words, write a definition of each earthquake scale.

- a. _____

- b. _____

- c. _____

Locating the Epicenter

14. Is the following sentence true or false? The closer an earthquake, the greater the time between the arrival of P waves and the arrival of S waves. _____

15. Geologists use circles to find the epicenter of an earthquake.

- a. What does the center of each circle represent? _____

- b. What does the radius of each circle represent? _____



Earthquakes ▪ *Review and Reinforce*

Earthquakes and Seismic Waves

Understanding Main Ideas

Answer the following questions in the spaces provided.

1. What are seismic waves?

2. In what order do the three types of seismic waves arrive at a seismograph?

3. Which type of seismic wave produces the most severe ground movements?

4. Describe the moment magnitude scale, and explain why it is useful in measuring earthquakes.

5. How do geologists locate the epicenter of an earthquake?

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

- | | |
|------------------------|---|
| _____ 6. focus | a. records ground movements caused by seismic waves as they move through the Earth |
| _____ 7. epicenter | b. slowest seismic waves that produce the most severe ground movements |
| _____ 8. surface waves | c. the point beneath Earth's surface at which rock under stress breaks and triggers an earthquake |
| _____ 9. seismograph | d. a measurement of earthquake strength |
| _____ 10. magnitude | e. the point on the surface directly above the point at which an earthquake occurs |