

CAUSE & EFFECT

Reflection & Refraction

Read the text and answer the questions.

Reflection and refraction are both examples of a wave's change in direction. Reflection is a property you might encounter on a daily basis. When you see your reflection in a mirror, or when you hear your voice echo in an empty hallway—that is wave reflection. How does wave reflection work?

Reflection is the change in direction of a wave, such as light or sound, when it bounces off a barrier. For example, your voice in an empty hall travels through the air. When it meets a wall (solid), it bounces back to you. You hear the reflected sound waves as an echo.

Reflection of light is one of the most important properties on Earth. Reflection of light allows us to see. When a light wave strikes an object it cannot pass through, parts of the light reflect, or bounce off. Our eyes detect this reflection of light and we see the object.

Refraction is the change of direction a wave makes when it enters a new medium. When a wave enters a new medium, it often changes speed, which causes the wave to bend. In short, refraction can be seen as the bending of a wave.

Have you ever looked at a pencil half in water and half out? The pencil appears bent. The light hitting the pencil above the water is traveling at a different speed than the light hitting the pencil in the water. Thus, light refraction causes the pencil to look bent.

- What word from the text best describes reflection?
 - What word from the text best describes refraction?
 - Give two examples each of reflection and refraction.
- What causes a wave to reflect?
 - What effects of reflection can we see?
 - What effects of reflection can we hear?
- What causes a wave to refract?
 - In the example of the pencil in water, how is light refracted?
 - What is the effect of refraction on the pencil?

COMPARISON OF PRIMARY SOURCES

Words on Sound

Read the texts and answer the questions.

"[Sound] can be both heard and felt. It can even be seen with the mind's eye. It can almost be tasted and smelled. Sound can evoke responses of the five senses. Sound can paint a picture, produce a mood, trigger the senses to remember another time and place... we hear sound with our entire bodies."

—Louis Colaianni

Bang, clang!
Clip and clop,
Sound can be brash,
And begin with a crash!

But pitter, patter,
Whimper and hush,
There's barely a peep,
As sound falls asleep.

Part A: Use the first text to answer the questions.

1. Summarize what the author says about sound.
2. Describe how the author seems to feel about sound.
3. What words would you use to describe the text?
4. How does this text affect your perspective of sound?
5. Identify an example of figurative language used by the author and explain its meaning.

PART B: Use the second text to answer the questions.

6. What words in the text are onomatopoeias (words that sound like the sound they represent)?
7. Cite two examples of personification in the text.
8. Compare and contrast the first stanza with the second stanza.
9. Describe the text's use of rhyme.
10. Identify an example of alliteration used in the text.

PART C: Comparison of sources

11. How are the two texts similar? How are they different?

VOCABULARY

Wave Vocabulary

Use a dictionary and other resources to complete the graphic organizer for each vocabulary word.

amplitude

mechanical wave

refraction

electromagnetic wave

medium

sound wave

frequency

radio wave

source

light wave

reflection

wavelength

DEFINITION	FACTS/CHARACTERISTICS
WORD	
EXAMPLES	NON-EXAMPLES

APPLYING CONCEPTS

Parts of a Wave

Use a dictionary or other resources to complete the graphic organizer for each vocabulary word. Then use each word's definition to identify it on the diagram.

Parts of a Wave

amplitude

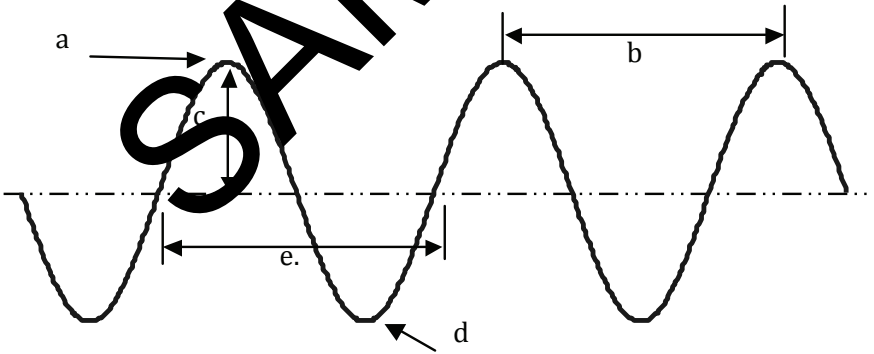
crest

period

trough

wavelength

DEFINITION	FACTS/CHARACTERISTICS
WORD	
EXAMPLES	NON-EXAMPLES



a) _____

d) _____

b) _____

e) _____

c) _____