Edgenuity

Warm-Up | Wave Interactions

Lesson Question

How do waves interact with objects and other waves?

Lesson Goals

Explore how waves interact with objects and other waves.

- **Distinguish** between absorption, transmission, reflection, refraction, and diffraction.
- **Compare** and **contrast** constructive and destructive interference.
- **Identify** everyday examples of wave interactions.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

absorption	the taking in of a wave by an object as the wave hits the object
diffraction	the bending and scattering of a wave as it hits an object or goes through an opening
interference	the phenomenon that occurs when two waves meet while traveling along the same medium
reflection	the bouncing of a wave after it hits an object

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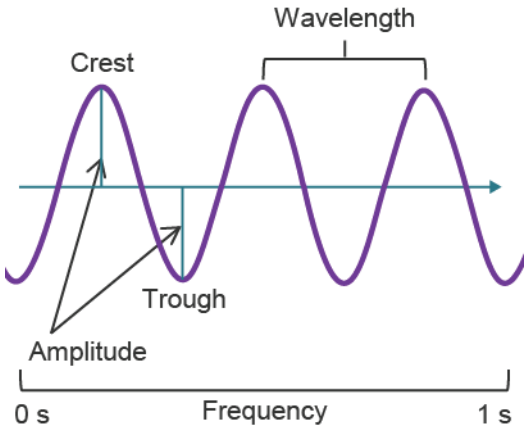
Words to Know

refraction	the bending of a wave as it passes through one medium to another medium
transmission	the passing of a wave through an object

Properties of Waves

- The amount of energy a wave carries corresponds to its amplitude.
- The frequency of a wave is equal to the number of wavelengths that pass a fixed point in a second.
- Frequency is typically expressed in hertz.
  - One hertz is equal to one wavelength per one second.



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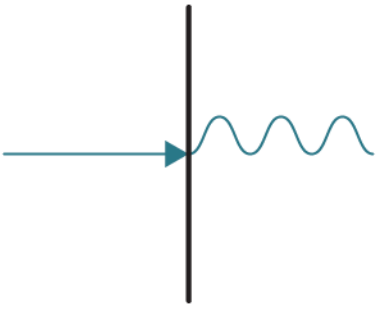
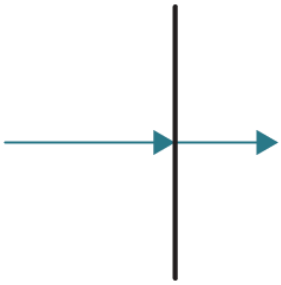
Absorption

- Absorption occurs when [matter] takes in energy from a wave.
  - Energy from the wave increases the [internal] energy of the object.



Transmission

- Transmission is the [passing] of a wave through an object.
  - Energy is absorbed on one side of an object and then [reemitted] on the other side.



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Reflection

- Reflection is the bouncing of a wave off the boundary between two [media].
  - Energy is absorbed on one side and reemitted on the [same] side.

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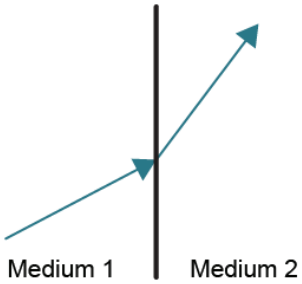
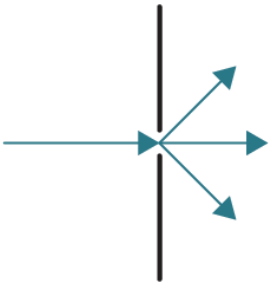
Refraction

- Refraction [bends] a wave as it passes through one medium to another.
  - This can [speed up] or slow down the wave, depending on the properties of the medium.



Diffraction

- Diffraction bends and [scatters] waves as they hit an object or go through an [opening].
  - This changes the [direction] of the wave and spreads out the energy.



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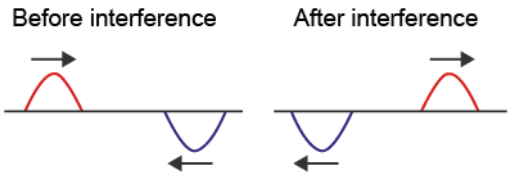
Interference

- Interference occurs when two [waves] meet while traveling along the same medium.
- When waves meet, they can build on each other or [break] each other down.



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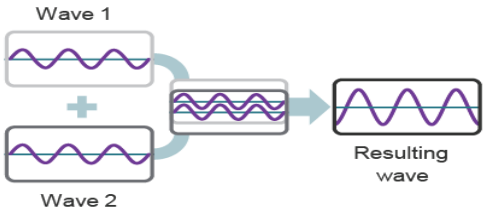
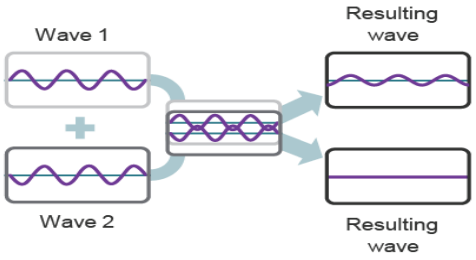
Constructive Interference

- Constructive interference occurs when two interfering waves have a [displacement] in the same direction.
- The resulting wave has greater [amplitude] and more energy.



Destructive Interference

- Destructive interference occurs when two [interfering] waves have a displacement in the [opposite] direction.
- The resulting wave has lower amplitude and [less] energy.



Summary | Wave Interactions

Lesson Question

How do waves interact with objects and other waves?

Answer

(Sample answer) Waves can interact with objects via absorption, transmission reflection, refraction, or diffraction. Waves can interact with each other; which results in constructive interference in which the waves combine or destructive interference in which the waves cancel some parts of each other out.

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Review: Key concepts

Type of Interaction	Definition
Absorption	The taking in of a wave by an object as the wave hits the object
Transmission	The passing of a wave through an object
Reflection	The bouncing of a wave after it hits an object
Refraction	The bending of a wave as it passes through one medium to another medium
Diffraction	The bending and scattering of a wave as it hits an object or goes through an opening

Summary | Wave Interactions

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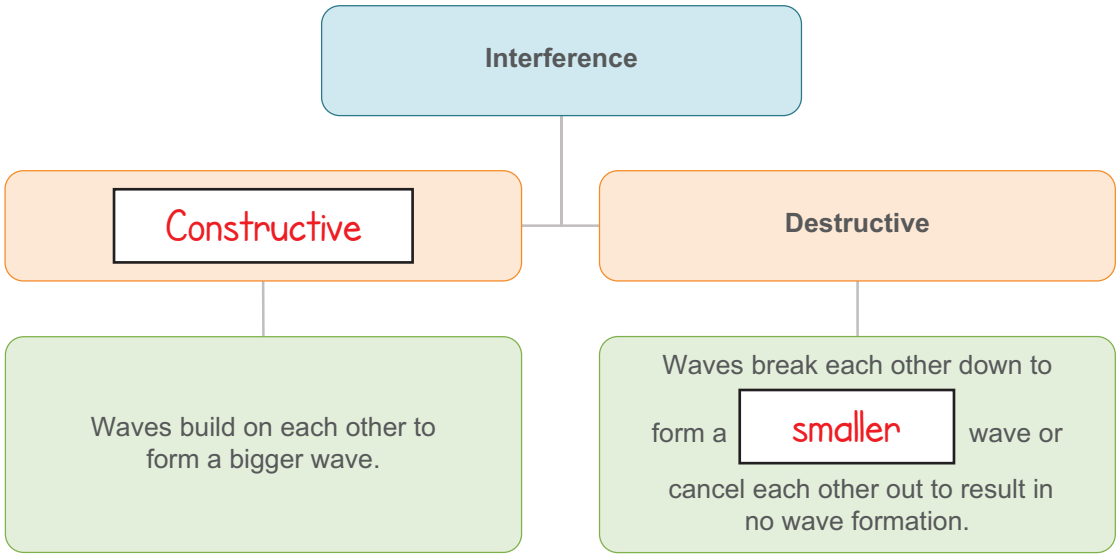
Review: Key concepts



Use this space to write any questions or thoughts about this lesson.