

Wave Interactions (p. 524 – 529)

I. Reflection, Diffraction, & Refraction

1. List three ways that waves normally move from a source.

1. Straight lines (Ocean Waves) 2. Circles (Pond ripples) 3. Spheres (Sound waves in air)

2. Define the term reflection.

Reflection – bouncing back of a wave when it meets a surface or boundary

3. When does reflection occur?

- When a wave strikes an object and bounces off

4. Define the term diffraction.

Diffraction – bending of waves around an obstacle or through a narrow opening

5. What wave situations produce diffraction?

1. Wave encounters an obstacle
2. Waves pass through a narrow opening

6. A wave diffracts more if its wavelength is large compared to the opening or obstacle.

Circle One : True False

AM = longer wavelengths
- diffract around buildings + mountains better

7. Why can a person hear something in a room before being in the room?

- Wavelengths of sound waves are similar to door size.

8. Define the term refraction.

Refraction – bending of waves as they pass from one medium into another

9. Why does refraction occur when a wave enters a new medium at an angle?

- One side of wave moves more slowly than other side.

10. Refraction always involves a change in the speed and direction of a wave.

Circle One : True False

Sperring Fish

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- Basketball
- Shaving
- Make-up

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II. Interference

1. Define the term interference.

Interference - combination of two or more waves that results in a single wave

2. What types of wave alignments occur during the following forms of interference?

(In phase) Constructive = Crests or compressions overlap at same time + same place

(Out of phase) Destructive = Crests + troughs overlap at same time + same place
 Compressions + rarefactions overlap at same time + same place

Ex. - Father pushing a child on a swing at right time

Garage Door
 Cell Phones
 Scrambler

3. What happens to the amplitude and loudness of the following forms of interference?

	Amplitude		Loudness	
<u>Constructive</u> (Circle One):	Larger	Smaller	Increases	Decreases
<u>Destructive</u> (Circle One):	Larger	Smaller	Increases	Decreases

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4. What is produced when light waves exhibit interference?

- Swirling rainbow effect.

5. Define the term beats.

Sounds like bees humming.

Beats - pulsating variation in loudness caused by combining sound frequencies that are slightly different

6. What produces the pulsating variations when beat loudness:

Increases = Compressions overlap or Rarefactions overlap

Decreases = Compressions + rarefactions overlap

YouTube - How are beats made?

7. How are instrument beats avoided in orchestras?

- Instruments are tuned prior to performance

III. Standing Waves

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1. Define the term standing wave.

Standing Wave - pattern of vibration that simulates a wave that is standing still

2. Circle the type of interference that occurs at each wave site.

Nodes: Constructive Destructive

Anti-nodes: Constructive Destructive



Tacoma Narrows Bridge

3. List three types of instruments that produce standing waves. (Not in the book.)

1. Violin 2. Flute 3. Drums