

Wave Behavior Test Remediation Notes

8.PS4.2 Compare and contrast mechanical waves and electromagnetic waves based on refraction, reflection, transmission and absorption and their behavior through a vacuum and/or various media.

Remember to write 2 facts from each slide

OR

Answer the questions on the slide.

When you have finished the notes return to Ms. Bullock's remediation page and watch the Wave Behavior Test video.

Mechanical vs. Electromagnetic Waves

- Waves transfer energy
- Mechanical waves require a medium to transfer energy
- Electromagnetic waves do not require a medium to transfer energy
- Wave can travel through mediums at different speeds depending on density of the material
- Both types of waves can reflect, refract, and diffract

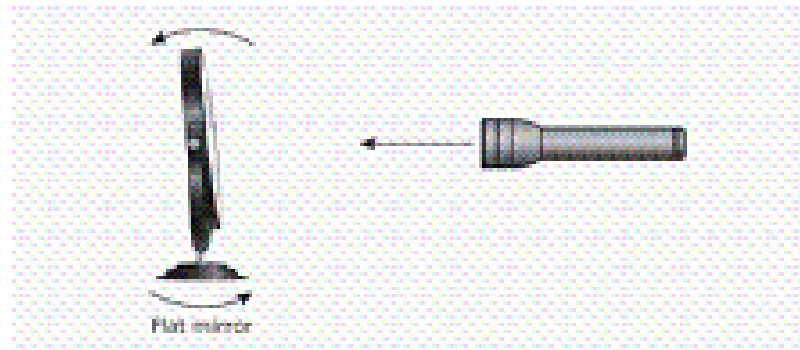
Questions

<u>Medium</u>	<u>Average Speed of Sound</u>
Oxygen	330 m/s
Air	346 m/s
Water	1482 m/s
Copper	5010 m/s
Granite	5950 m/s

1. Why does sound travel through granite faster than water?

Reflection

- When waves encounter a change in medium they can bounce off
- The wave that is reflected off the changed medium will have less energy than the original wave
- The wave will reflect off the changed medium at the same angle
- For example:
 - Light will reflect off a mirror
 - Sound will reflect off a canyon wall producing an echo
 - Water waves will reflect off the shoreline



Questions

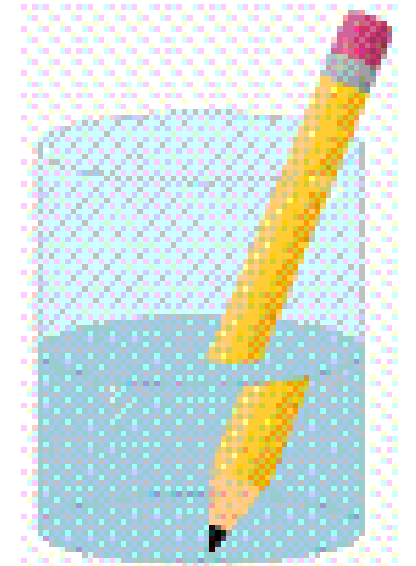
William goes on vacation at the Grand Canyon with his family. While hiking into the canyon he gets separated from his dad. He yells out trying to locate his dad. Within seconds he hears an echo of own voice. A few minutes later he hears his dad's voice begin to echo through the canyon.

1. What caused the echo? _____

2. What can be said about the wavelength of the echo to the wavelength of the original wave? _____

Refraction

- Waves will change speed when moving from one medium to another
- When light is moving from air to water, the change in speed can cause distortion
- The pencil appears broken because the light passes into the water and slows speed. This causes the pencil to appear broken

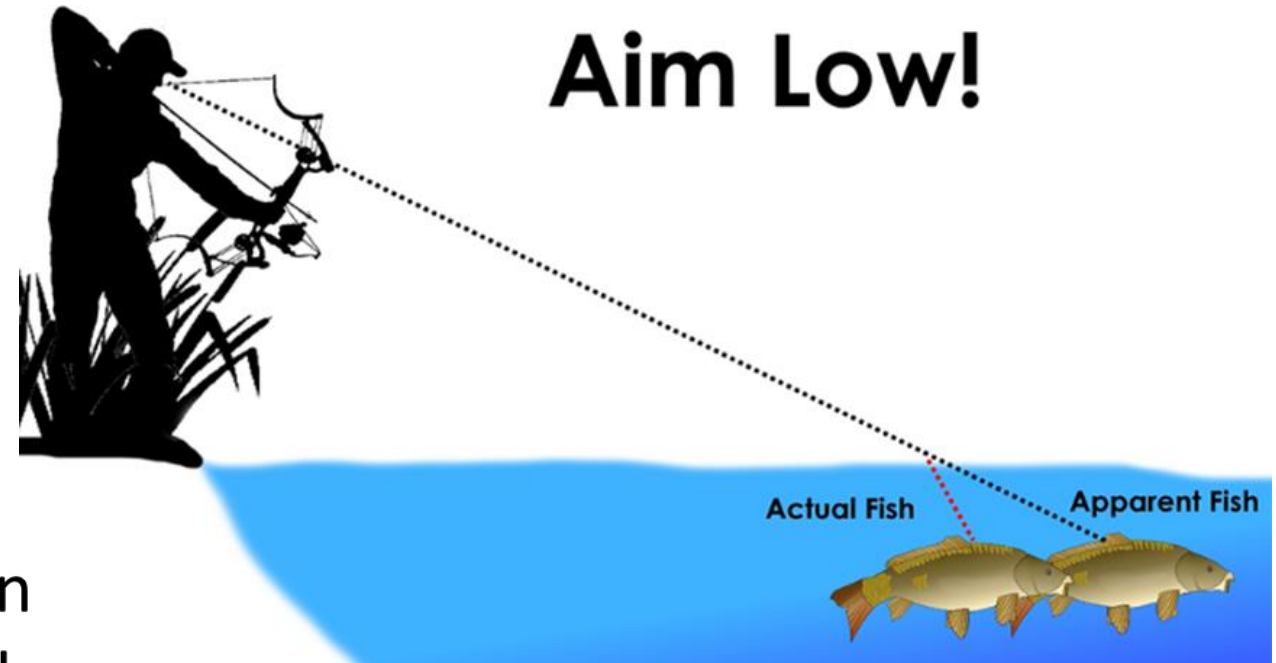


Questions

#1 What property of waves causes the fish to appear in a different location under water?

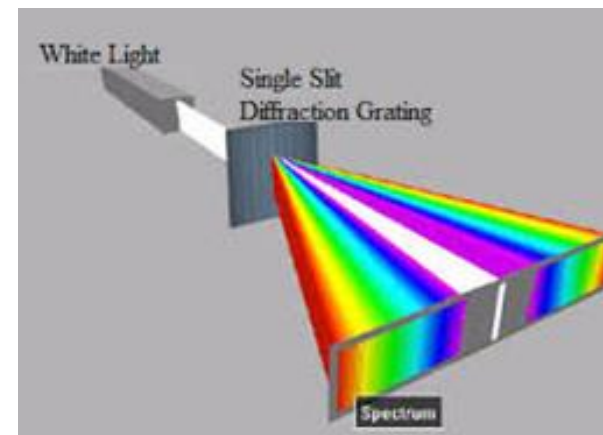
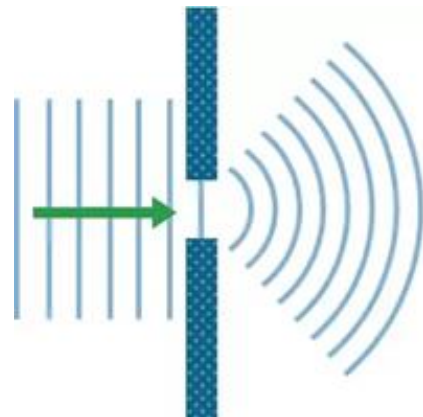
#2 What happens to the speed of the light waves as it enters the water?

#3 Standing on the shore the fisherman needs to aim low in order to hit the fish. How would his aim change if the fisherman was also under water?



Diffraction

- Waves will bend around an obstacle or through a small opening
- Light can be diffracted through small slits and separated into multiple colors
 - For example you can see multiple colors on a CD when the light shines
- Sound can diffract, but the wave do lose energy.
 - For example you can hear a teacher talking to the class when you are standing in the hallway



Questions

1. What property is shown in the picture?



2. Name two examples of wave that will diffract.

3. When white light diffracts what can be observed?
