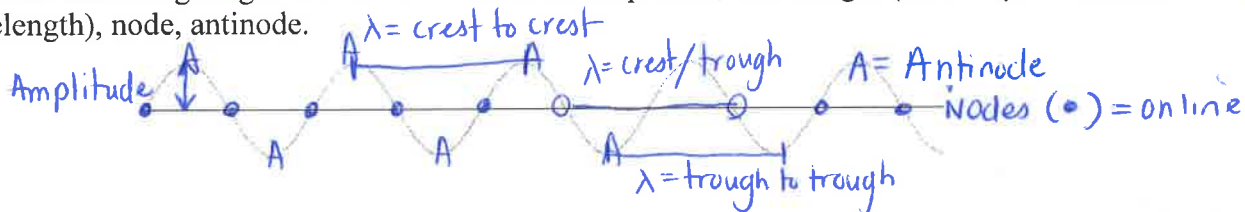


Academic Physics
Unit 1 Review

Name KEY
Date KEY

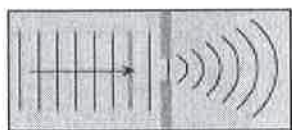
Wave Basics & Equations

1. What are the differences among transverse and longitudinal waves?
 2. Label the following diagram. Include these terms: amplitude, wavelength (all 3 ways to indicate wavelength), node, antinode.



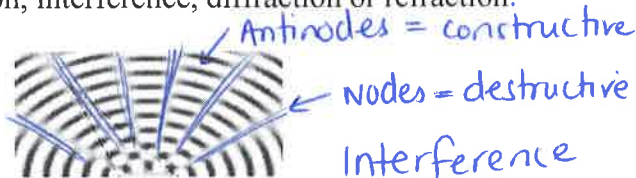
3. Identify the following images as one of the following: reflection, interference, diffraction or refraction.

a)



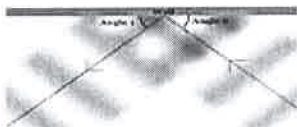
Diffraction

c)



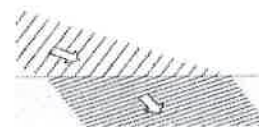
Each line is pointing to a source of a wave.

b)



Reflection

d)



Refraction

2 mediums!

4. A trough of amplitude 11 cm meets an opposing trough of amplitude 9 cm.
 a. What type of interference does this represent? *constructive*
 b. What is the amplitude at the point where the interference occurs? *20 cm*
 c. Draw a diagram for this type of superposition. *9cm ← 11cm* *← 11cm 9cm →*
5. Ripples in a pond each have a wavelength of 8.0 cm and frequency of 3.0 Hz. What is the speed of a ripple in m/s? (remember conversions?). *λ = 0.08m* *f = 3.0* *s = λf = 0.08 * 3* *S = 0.24 m/s*
6. While hiking in the mountains, Jon discovers an interesting cave. He yells into the cave and hears an echo 2.5 seconds later. How far into the mountainside does the cave extend? Assume $s = 343$ m/s.
s = 343 m/s *t = 2.5s* *d = ?* *s = 2d/t* *343 = 2d/2.5* *d = 429m*
7. A sound wave produced by a clock chime is heard 400 m away 1.25 s later.
 a. What is the speed of sound of the clock's chime in air? *s = d/t = 400/1.25* *S = 320 m/s*
 b. The sound wave has a frequency of 512 Hz. What is its period? *T = 1/f = 1/512* *T = 0.00195s*
 c. What is its wavelength? *s = λf* *320 = λ * 512* *λ = 0.625m*
8. Water waves in a shallow dish are 0.06 m long. At one point, the water oscillates up and down at a rate of 4.8 oscillations per second.

λ = 0.06m
f = 4.8 osc/s

- a. What is the speed of the water waves? *S = λf = 0.06 * 4.8* *S = 0.288 m/s*

- b. What is the period of the water waves? *T = 1/f = 1/4.8* *T = 0.208s*

Light – Color, Interactions, Behaviors

- How fast does light travel in a vacuum? $3.0 \times 10^8 \frac{m}{s}$
- What happens to the wavelength of light as the frequency increases? λ decreases (λ inversely prop. to f)
- A violet light has a frequency of 7.3×10^{14} Hz. What is its wavelength? $s = \lambda f$ $3.0 \times 10^8 = \lambda \cdot 7.3 \times 10^{14}$
 $\lambda = 4.11 \times 10^{-7} m$
- Of the colors green and violet, which has the longest wavelength? green
- Which has the highest frequency, microwaves or ultraviolet light? ultraviolet
- Suppose you add red and blue light together. What color will result? magenta
- What light color do you add to blue light to obtain white light? green, red (can also say yellow)
- What primary pigment colors must be mixed to get red? yellow, magenta
- What color will a yellow banana appear when illuminated by...
 - white light? yellow
 - yellow light? yellow
 - blue light? black
 - red light? red
- Describe the 5 characteristics of images seen in a plane (flat) mirror. virtual, $d_i = d_o$, same size, upright, left-right reversed
- Where is the image of an object in a plane mirror? Behind mirror
- Which of the following best describes the image formed by a plane mirror?
 - virtual, inverted and enlarged
 - real, inverted and reduced
 - virtual, upright and the same size as object
 - real, upright and the same size as object
- When light passes from a more optically dense medium into a less optically dense medium, it will bend _____ (towards, away from) the normal.
- When light passes from a less optically dense medium into a more optically dense medium, it will bend _____ (towards, away from) the normal.
- A light ray in air enters and passes through a block of glass. What can be stated with regard to its speed after it emerges from the block? [The speed would be less inside the glass]
 - Speed is less than when in glass.
 - Speed is less than before it entered glass.
 - Speed is same as that in glass.
 - Speed is same as that before it entered glass. moves faster again b/c medium changes back to air
- A ray of white light, incident upon a glass prism, is dispersed into its various color components. Which one of the following colors experiences the greatest amount of refraction?
 - Orange
 - Violet shorter λ undergoes the most refraction. violet the most; red is refracted the least.
 - Red
 - Green