

Wave Reflection, Refraction, Diffraction Notes

1. Objectives

- Recognize and describe the properties of:
 - Wave _____
 - Wave _____
 - Wave _____

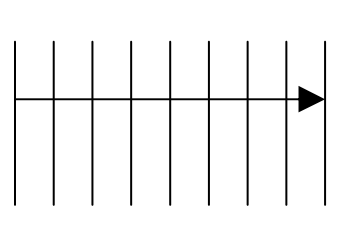
2. Wave Reflection

a. Where have you experienced waves reflecting?

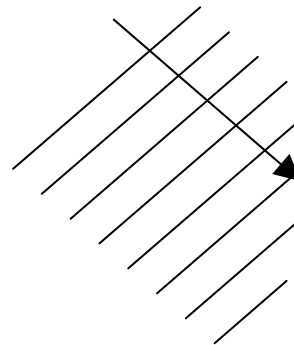
- _____
- _____
- _____

b. Wave reflections

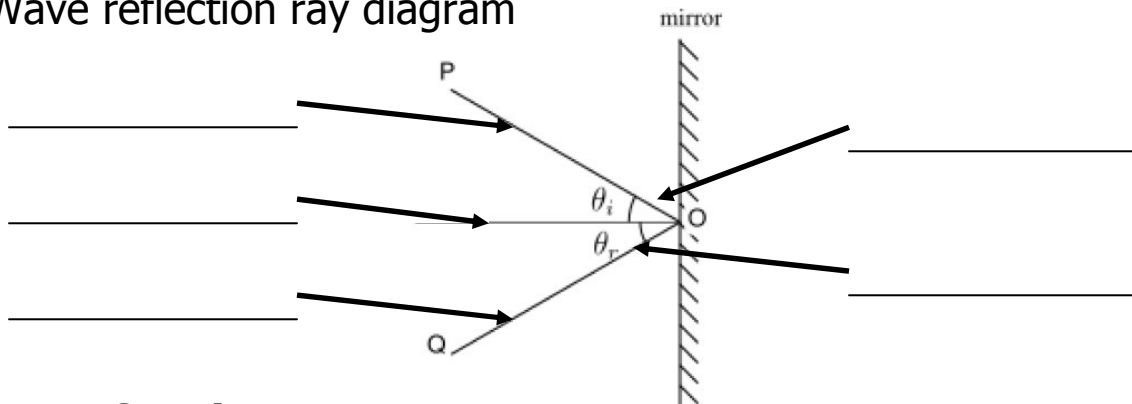
- Waves at right angles
(Draw in Reflecting waves)



- Waves at oblique angles
(Draw in Reflecting waves)



c. Wave reflection ray diagram



3. Wave Refraction

a. Where do waves move from one medium to another?

- i. _____
- ii. _____
- iii. _____

b. When water passes from deep water to shallow water (ie. to a more dense medium) - Wavelength _____

c. When waves move from one medium to another, two things happen:

- i. _____
- ii. _____

d. Write the universal wave equation: $v =$ _____

Frequency doesn't change from as a wave passes from one medium to another. Therefore write the equation for frequency for each medium:

$$f_1 = \text{_____} \quad f_2 = \text{_____}$$

Since $f_1 = f_2$, combine the two equations below:

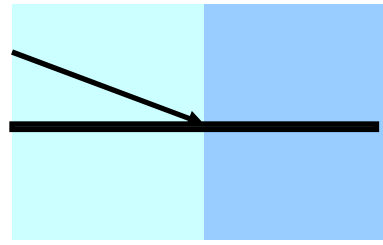
e. Sound wave _____ changes depending on air _____

$$v_{\text{SOUND}} = \text{_____ m/s} + \text{_____}$$

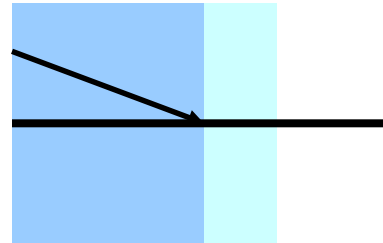
Sound moves _____ in cold air

f. Refraction of oblique waves

- Waves moving into denser medium
(Draw in refracting ray)



- Waves moving into less dense medium
(Draw in refracting ray)

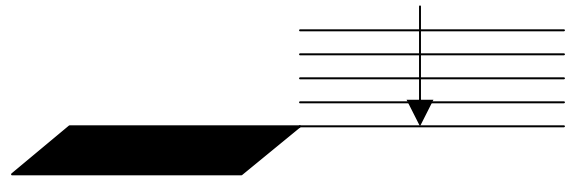


g. When waves enter _____ water they bend _____ the normal (becoming more _____ to shore)

4. **Wave Diffraction**

a. Around corners

- Shorter incident wavelengths are diffracted _____

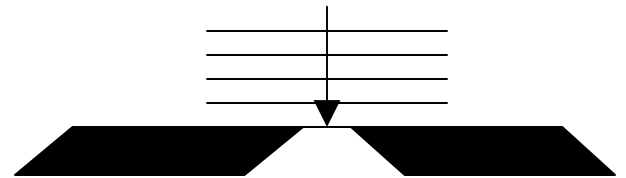


- Longer incident wavelengths are diffracted _____

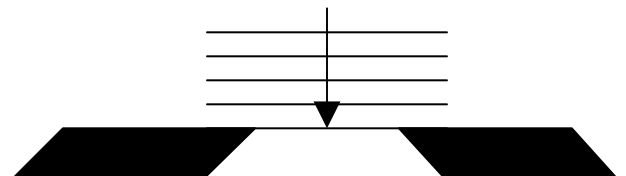


b. Through openings

- Waves passing through small openings are diffracted _____

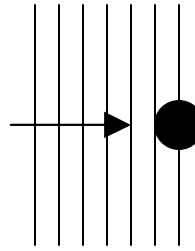


- Waves passing through large openings are diffracted _____

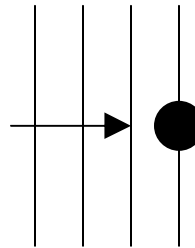


c. Around objects

- Short wavelengths diffract _____ around an object



- Long wavelengths diffract _____ around an object



5. Summary

- Incident and reflected rays are _____ to wavefronts
- Angle between incident ray and Normal: _____
- Angle between reflected ray and Normal: _____
- Angle of _____ = angle of _____
- Waves _____ when traveling from 1 medium to another (and _____ & _____ change)
- _____ = _____
- Oblique _____ rays bend _____ the normal when entering a _____ medium
- Shorter wavelengths are diffracted _____, Longer wavelengths are diffracted _____
- The _____ the opening that waves pass through the _____ the waves will be diffracted
- _____ do not bend around corners, but _____ do