

Name _____

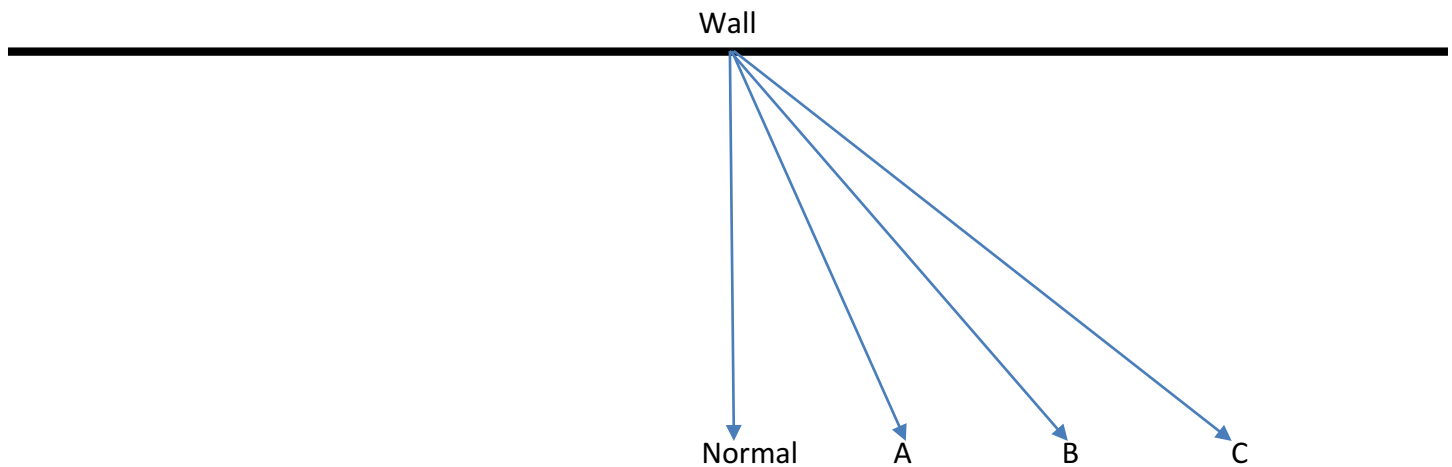
Lab - Behavior of Waves

Station 1 Reflection

Materials: Ball, wall, protractor, ruler

Procedure:

1. You will roll the ball into a designated spot on the wall in the lab.
2. Roll the ball to the spot straight on. This is the "normal" line or Angle of Incidence.
3. Roll the ball from each point.... A, B, and C.
4. Draw the reflection of each line and label it A^1 , B^1 , and C^1 below.



Reflection Data:

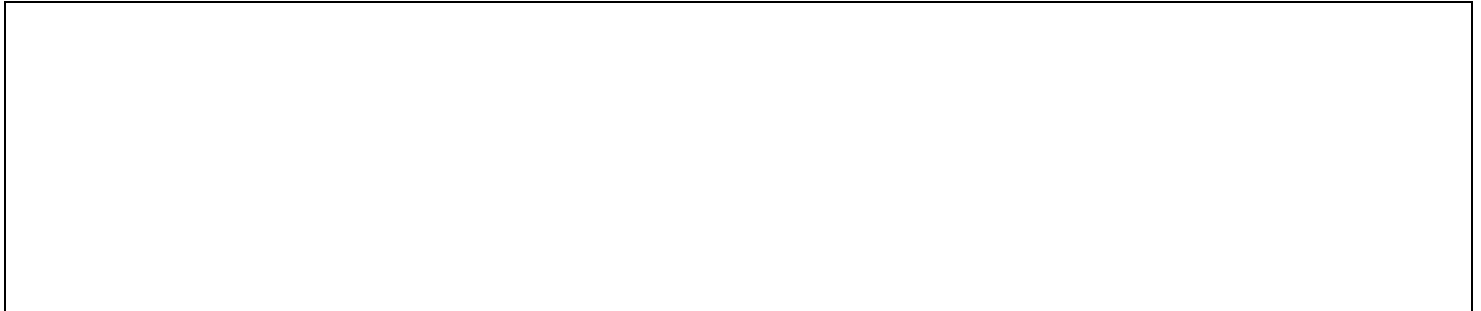
Ray	Angle of Incidence (Angle from Normal to Each letter)	Angle of Reflection (Angle from each letter to its reflection)
A		
B		
C		

5. How does the angle of reflection compare the corresponding angle of incidence?
6. How would the information you learned from this lab, improve a person's pool game?

Station 2 Diffraction

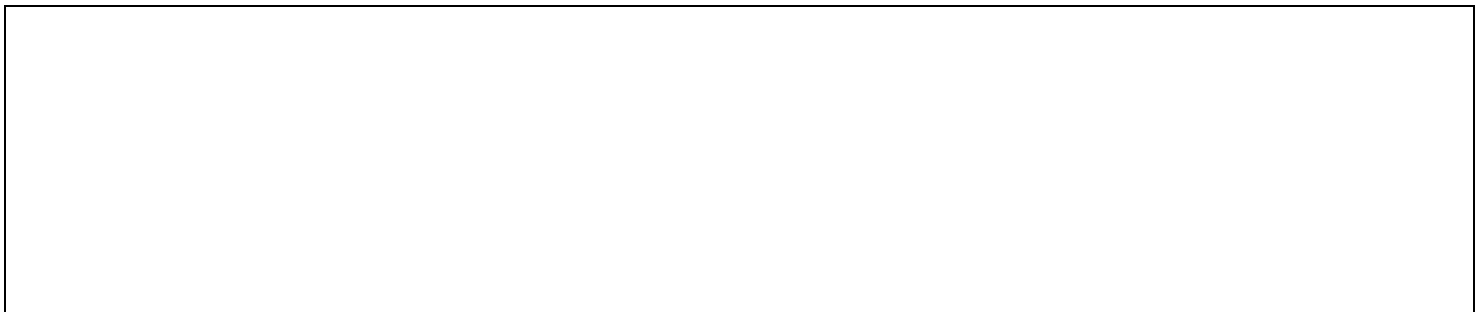
7. Go to <http://www.acoustics.salford.ac.uk/feschools/waves/diffract.htm>
8. Using the animations on-line investigate how waves are diffracted.
9. Be sure to include detailed drawings and labels.
10. Complete the online questions.

Light Wave – How do light waves behave around corners? (Draw what you observe.)



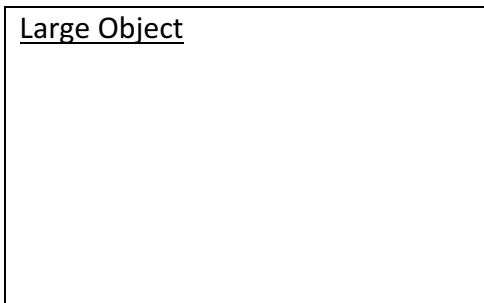
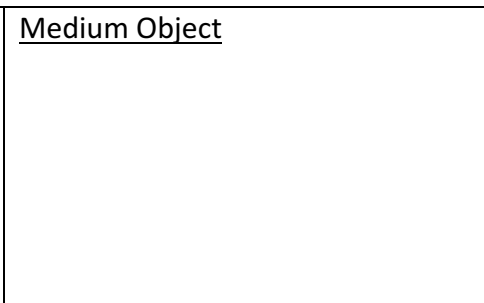
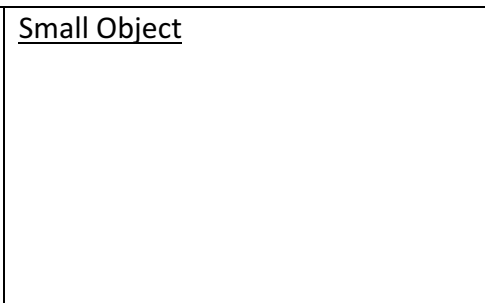
11. Describe how a light wave behaves around a corner. How does size affect the wave?

Sound Wave – How do sound waves behave around corners? (Draw what you observe.)



12. Describe how a sound wave behaves around a corner.

Barriers– How do waves behave when they encounter a barrier in a ripple tank? (Draw what you observe.)

<u>Large Object</u>	<u>Medium Object</u>	<u>Small Object</u>
		

13. Describe how waves behave in a ripple tank when they encounter a barrier.

Station 3 Refraction

Materials: 2 beakers, 2 straws, water, and corn syrup and Chromebook

Place a straw into the water and let the handle rest on the side of the beaker. Look into the glass from the side and describe what happened to the straw.

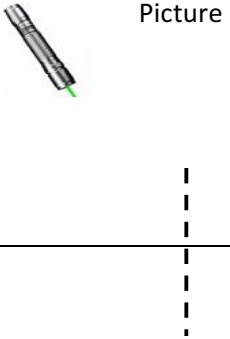
Place the other straw into the corn syrup. Look into the glass from the side and describe what happened to the straw.

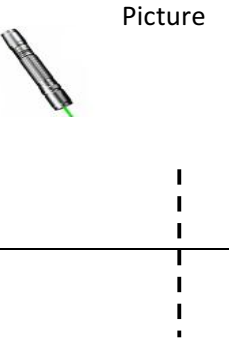
Draw your observations of the side view of the beaker, straw and water

Draw your observations of the side view of the beaker, straw and corn syrup

Click on the following Bending Light Simulation link: <https://phet.colorado.edu/en/simulation/bending-light>. Complete the activities and questions below.

Click on Intro - Press the red button to turn on the laser. Select the combinations of mediums (Glass, Air, or Water). **Draw the resulting path in to create a picture that shows the light's path through the different mediums.** Use the green tool labeled intensity to give the intensity of the light in each medium.

Top Medium AIR Intensity _____	Picture 
Bottom Medium WATER Intensity _____	

Top Medium GLASS Intensity _____	Picture 
Bottom Medium AIR Intensity _____	

14. Which combination of mediums created the larger bend?
15. Based on your data, what patterns do you observe about light when it travels from one medium into another?
16. How does this phenomenon explain why the straw appears like it is bent in the water and corn syrup?

Station 4 Absorption of Waves

Materials: flashlight, gummy worm, and Chromebook

Start by laying the gummy worm on the white piece of paper on the table. Make sure it is straight as possible.

Turn the light on and place it at one end of the worm. Focus the light on just one color.



17. Did the light on the other side of the worm stay white like the flash light? Why or why not?



Now slide the light across the worm to the next color.

18. Did the light stay the same color? Explain why you think this occurred.

19. Continue sliding the flashlight across the gummy worm. Explain what happens to the color of the light.

Use the Chromebook to watch and answer the questions that go along with the Bozeman Science video.

https://www.youtube.com/watch?time_continue=4&v=DOsro2kGjGc

20. What are 3 possible things that can happen as light moves from the air to the gummy bears?

21. What happens to light if it disappears while going through another medium?

22. How do we know what color is reflected?

23. How do we know what colors are absorbed by a green leaf?

24. How does a leaf use the energy from the colors of light it absorbs?

25. Draw a picture of the gummy worm at your station. Label where light is absorbed, reflected, and transmitted.

