NOTES – BEHAVIOR OF WAVES

Behavior of Waves	Light and sound waves can _____ when they come in contact with different _____, barriers or objects.
Types of Mediums	There are _____ types of mediums Solid, Liquid, Gas & Plasma.
Behavior of Waves	Light and sound waves are affected _____as they pass through different obstacles. They can be: • _____ • absorbed • _____ • diffracted or • _____
Reflection	When incoming light or sound waves _____an object and _____off.
Absorption	Sound or light waves hit the molecules _____the object and are taken in and transferred into _____.
Refraction	Light and sounds waves _____ directions as they pass through different mediums_____the waves at different angles.
Diffraction	The _____ and _____ of waves through a small slit around obstacles.
Scattering	When light and sound waves _____ off an object the waves go in a variety of different _____ and in different _____.
Light Waves	Light can travel through _____ (vacuum), solids, liquids, gases & plasmas.
Sound Waves	Sound _____ travel through travel through solid, liquid, gas & plasma. Sound _____ travel through space (vacuum).

Webquest - Behavior of Waves

Task 1- Newsela Article-Wave Behaviors https://newsela.com/read/lib-wave-behaviors/id/56251/?collection_id=2000000156

1. Can we predict how waves behave?
2. When a SOUND wave reflects off a wall, it is called _____.
3. Does sound travel faster in water or air?
4. When waves bend or spread out, this is called _____.
5. The interaction of two waves is called _____.
6. Explain constructive interference _____.
7. Explain destructive interference _____.

Task 2- Scattering- https://digital.scetv.org/knowitall/nasa/light/scattering_light.html

8. The sun is a natural source of _____ _____.
9. Our eyes see the _____ of the sunlight off the objects around us.
10. When the sunlight passes through water, it breaks into the colors of the _____.
11. How much light is reflected? Hint: total _____
12. How much light is absorbed? Hint: total _____
13. Light waves are identified by _____ and _____.
14. The atmosphere acts like a filter and _____ the shorter wavelengths in many directions.
15. Clouds with a high _____ concentration and many small _____ scatter much more light.

Task 3- Absorption- https://www.youtube.com/watch?time_continue=4&v=DOsro2kGjGc

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

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

18. How do we know what color is reflected?

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

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

Task 4- Interference & Diffraction- https://phet.colorado.edu/sims/html/wave-interference/latest/wave-interference_en.html

- Select "Interference"
- On the right side of the phet, select the light icon and then click on the green button for the top light.
- Then click on the green button for the bottom light to observe what happens when the waves crash into each other.

21. Draw what light waves look like when one light wave interferes with another light wave.

- On the right side of the phet, click on the speaker to observe sound waves.
- Click on the green button for the top speaker. Then click on the green button for the bottom speaker to observe what happens when the waves crash into each other.

22. Draw what the sound waves look like as one sound wave crashes into another sound wave.

- On the bottom of the phet, look for the **"slits"** interactive and click on it.

- On the right side of the phet, select the light icon and change the slit to 200 nm.

23. Then push the green button on the light generator and observe what how the light waves move. Draw what the light waves do with the small slit.
    - Change the slit to 1000 nm and start the simulation.
24. What is different between the 200 nm slit and the 1000 nm slit?

25. What is similar between the 200 nm slit and the 1000 nm slit?

26. On the right side of the phet, change setting from one slit to 2 slits. Start the wave generator and draw a picture of what happens.

27. What is different about the wave of one slit compared to 2 slits?

28. What is similar about the wave of one slit compared to 2 slits?

29. Explain how a wave diffracts when moving through a slit.

Task 5- Reflection- https://www.ck12.org/book/cbse_physics_book_class_xi/section/14.4/

30. Draw a diagram of wave reflection.
    a. Make sure to label incident ray and reflected ray.
31. What is an example of reflection that you see every day?
32. What is the law of reflection?

Watch the video at: http://www.youtube.com/watch?v=YQHbRw_hyz4

33. What happens to the wave when it is reflected from an open end?

34. What happens to the wave when it is reflected from a fixed end?

Task 6 Refraction- https://phet.colorado.edu/en/simulation/bending-light.

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 	Top Medium **GLASS** Intensity _____	Picture 
Bottom Medium **WATER** Intensity _____		Bottom Medium **AIR** Intensity _____	

35. How did the light bend as it traveled from AIR to WATER?

36. What did you observe about the light as it traveled from GLASS to AIR? Explain this observation.

37. Based on your data, what patterns do you observe about light when it travels from one medium into another?

Click on **Prisms** at the bottom of the screen. Press the red button to turn on the laser.

38. Set the "environment" and "objects" to the **same** mediums. Drag each prism in front of the light beam. Explain what happens.

39. Set the "environment" and "objects" to **different** mediums. Drag each prism in front of the light beam. Draw two of the shapes below. Include the 'environment" and "objects" you used.

Environment: _____ Objects: _____	
Environment: _____ Objects: _____	

40. What patterns do you see in the laser beams?

41. What happens when you put the square in front of the beam? Why do you think this happens?

42. Click on the laser pointer with 5 beams. Put the different shapes in front of the beams. Describe what happens.