1. **Tower Assault** on Vocab Arcade [choose *Gepeto* under “All Programs”] for the word list “8FA Wave Behavior (S8P4b)” until you can move through the list quickly with no errors. Add your initials to compete with others. Make note of your…

* Beginning Time
* Best Time
* Slowest Word(s)
* Fastest Word(s)

1. **Study Jams on Energy Light and Sound**

<http://studyjams.scholastic.com/studyjams/jams/science/energy-light-sound/light-absorb-reflect-refract.htm>

Take the quiz and write down your score \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Brain Pop**: watch the video on Refraction and Diffraction 2 times. Take the review quiz and review your results. Then take classic quiz and write down your answers below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2. | 3. | 4. | 5. |
| 6. | 7. | 8. | 9. | 10. |

1. **Reflection, Refraction, and Diffraction** <http://www.physicsclassroom.com/class/sound/Lesson-3/Reflection,-Refraction,-and-Diffraction>

* Explain how sound is reflected.
* Explain how sound is refracted.
* Explain how sound is diffracted.

1. **Diffraction** <http://www.acoustics.salford.ac.uk/feschools/waves/diffract.php>

Which of these is true:

When the wavelength is bigger than an obstacle, then the sound waves bend around the obstacle.

When the wavelength is smaller than an obstacle, then the sound waves bend around the obstacle.

Which of these is true (applying these rules to sound waves rather than water waves):

Behind a barrier, the sound which has the longest wavelength compared to the size of the obstacle will sound quietest.

Behind a barrier, the sound which has a shortest wavelength compared to the size of the obstacle will sound quietest.

Which of these is true:

Behind a barrier, the sound which has a longest wavelength compared to the size of the obstacle will be loudest.

Behind a barrier, the sound which has a shortest wavelength compared to the size of the obstacle will sound loudest.

True or False:

"The amount of diffraction that occurs depends on both the size of the obstacle and the wavelength of the sound."

True

False

Why can't BBC Radio 1 be broadcast on 98.9 FM over the whole country, using a large number of local transmitters all tuned to the same frequency? (Hint - think about superposition, and constructive and destructive interference).

Diffraction also occurs when a wave passes through a gap (or slit) in a barrier. This is shown in the animation below (**Note:** [Flash Player 7 required](http://www.macromedia.com/go/getflashplayer)). Try dragging the slider to change the size of the gap. How does this affect wave diffraction? When does maximum diffraction occur? (Think about your previous findings on the diffraction of sound around an obstacle).

1. **Design your instrument**: (bring supplies by Thursday) Answer the following questions about your design
   1. Name of instrument, instrument family, materials needed, design, procedures, problems and solutions, conclusion.
   2. How do the materials, shape, and overall design affect the reflection of sound in the instrument?
   3. How can you vary the pitch of sound that your instrument makes (or how does the pitches that your instrument make compare to that of a classmates)? What is the difference between a higher pitch and a lower pitch?
   4. How could you improve the sound that your instrument produces?
   5. Attempt to produce a harmony either on your own instrument or with another student’s instrument. Describe what causes a harmony (constructive interference).
   6. Make a loud sound on your instrument, and then make a soft sound with your instrument. Draw a picture of two waves that compares the loud sound to the soft sound (amplitude).
2. **Design** a room for music or entertainment <https://www.youtube.com/watch?v=JPYt10zrclQ>
3. **Choose three and research**

Write a 5 to 7 sentence paragraph to answer the question. Make sure you discuss the appropriate waves and wave behaviors in each answer.

* What causes the sunset to be different colors?
* Why are shadows “fuzzy” on the edges?
* How can we talk to astronauts in outer space?
* Why are there two different “kinds” of radio: AM and FM?
* Why are some surfaces more reflective than others?
* What factors must be in place for a rainbow to form?
* How does a television screen work?
* What if I could travel the speed of light…?
* Why do the leaves of some deciduous trees change color in the fall?