

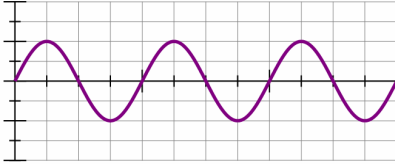


Sound Waves

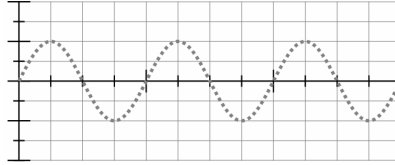
Name: _____

Part 1: Sound Wave Graphs

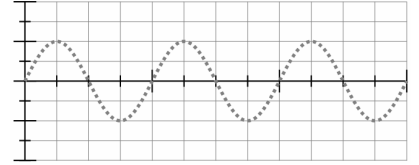
The wave graph below represents a sound wave.



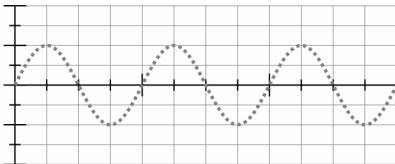
a. How would a wave that has a greater **AMPLITUDE** and the same frequency look? *Sketch your idea on the grid below.*



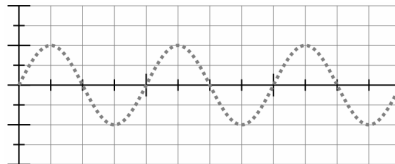
b. How would a wave that has a greater **FREQUENCY** and the same amplitude look? *Sketch your idea on the grid below.*



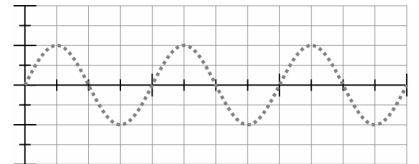
c. How would a wave that has a lesser **AMPLITUDE** and the same frequency look? *Sketch your idea on the grid below.*



d. How would a wave that has a lesser **FREQUENCY** and the same amplitude look? *Sketch your idea on the grid below.*

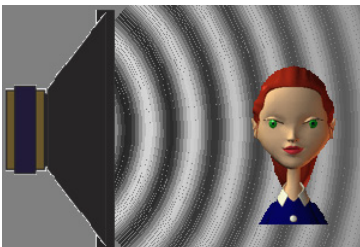


e. How would a wave that has a lesser **FREQUENCY** and the greater **AMPLITUDE** look? *Sketch your idea on the grid below.*



Part 2:

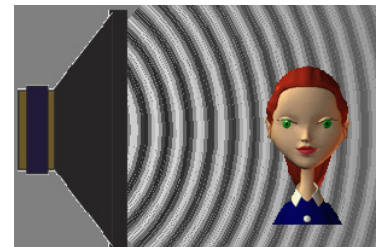
A student is listening to a pure sound wave being produced by a speaker. Each picture shows a sound with a different frequency, but with the same amplitude.



A



B



C

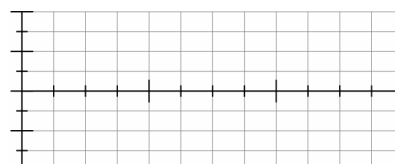
a. Which picture (A, B, or C) shows the student listening to the sound with the highest frequency? Why do you think so?

.....

b. Which picture shows the student listening to the sound with the lowest frequency? Why do you think so?

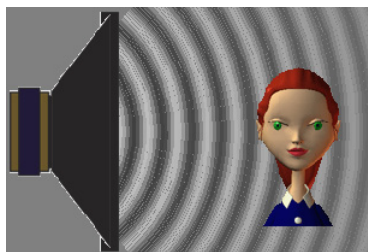
.....

c. Draw a wave graph for each sound that indicates the relative frequency of each sound.

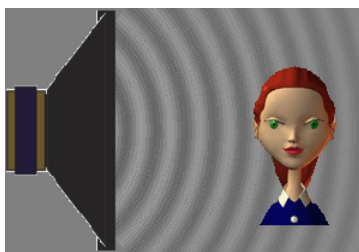


Part 3:

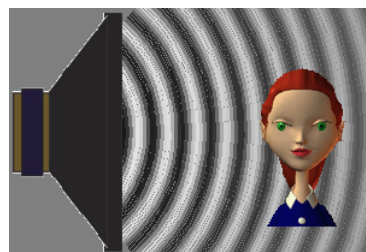
The same student is now listening to sound with different amplitudes. These pictures show sounds with different amplitudes, but with the same frequency.



D



E



F

- a. Which picture or pictures (D, E, or F) would best show the student listening to the sound with greatest amplitude?

Why do you think so?

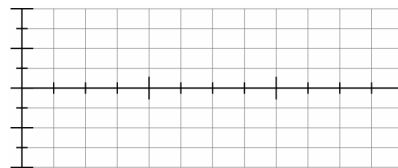
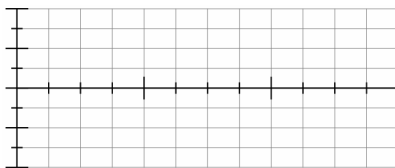
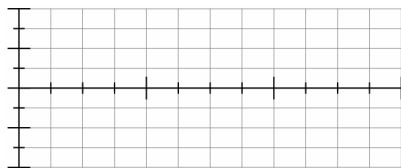
.....

- b. Which picture or pictures would best show the student listening to the sound with the lowest amplitude?

Why do you think so?

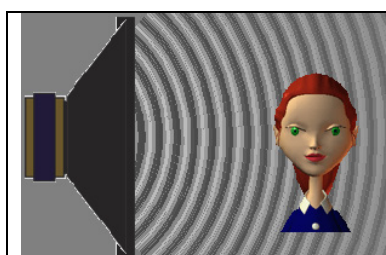
.....

- c. Draw a wave graph for each sound that indicates the relative amplitude of each sound.

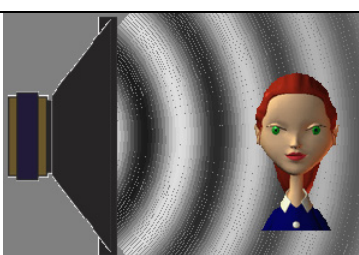


Part 4:

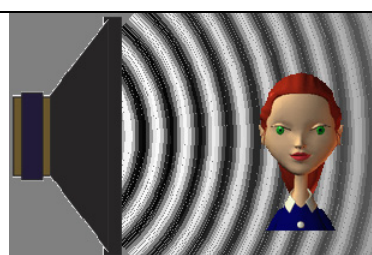
View the diagrams below and answer the questions that follow:



I



II



III

- a. Which sound has the highest frequency? Why?

- b. Which sound has the highest amplitude? Why?

- c. Which sound has the lowest frequency? Why?

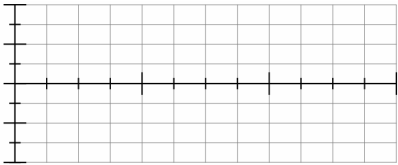
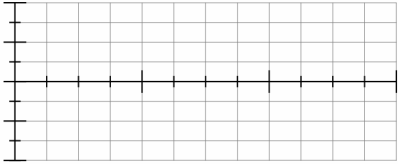
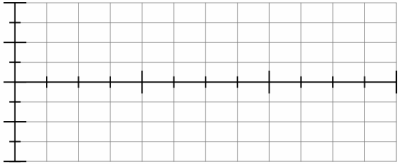
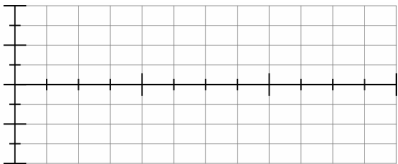
- d. Which sound has the lowest amplitude? Why?

Part 5:

Creating sounds using a simulator “Sound” produced by PHeT.

- 1. Discuss examples of things that make the different types of sounds listed in the table below. **Write your examples in the table below.**
- 2. Open **Sound** simulation from the icon on your computer.
Use the **Listen to a Single Source** tab. Turn on the **Audio Enabled** so you can hear the sound.

Create the sounds in the table below!





Sound	Example of something that makes this sound	Explain how you used the simulation to make the right noise	Draw a wave graph to show what the sound looks like.
Case A: Loud, High-pitched			
Case B: Soft, High-pitched			
Case C: Loud, Low-pitched			
Case D: Soft, Low-pitched			

- 3. Which waves
 - a. Have a high frequency?
 - b. Have a large amplitude?
 - c. Explain....
 - i. What controls pitch:
 - ii. What controls loudness:
 - d. Describe the movement of the speaker for a loud sound compared to a soft sound.
.....
 - e. Describe the movement of the speaker for a high pitched sound compared to a low pitched sound.
.....

Creating Sounds ...

- **Compare** how you would have to **move the speaker** to produce the sound in each case.
- **Describe the motions below.**
- Be sure to describe what is different about each one.

Is this sound
**Low or
highpitch?**
Loud or soft?

Sound		
Case E: Low Frequency, Low Amplitude		
Case F: High Frequency, Low Amplitude		
Case G: Low Frequency, High Amplitude		
Case H: High Frequency, High Amplitude		

4. **Develop rules** for what effects frequency and what effects amplitude to explain your observations from this activity.

5. Some of your friends are confusing frequency and amplitude. How would you describe these terms in **your own words or pictures** to help your friends understand each one?