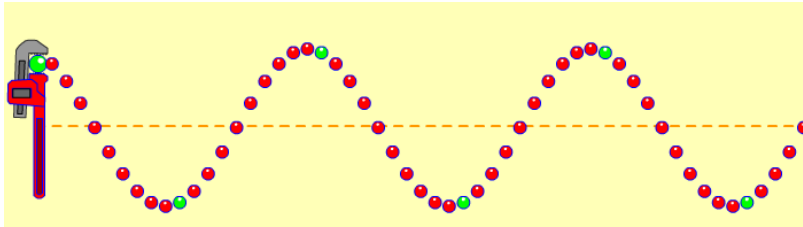


Activity 5 Student Data Sheet - Sound Waves

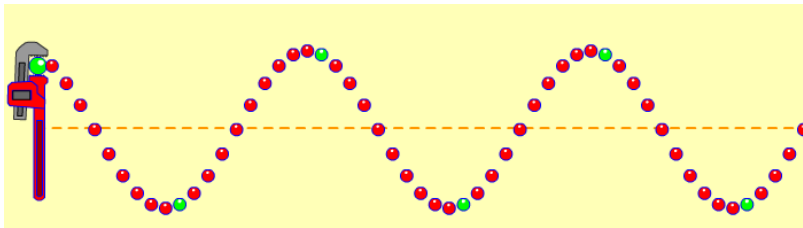
Pre-lab

A wave is created on this string by moving the wrench up and down.



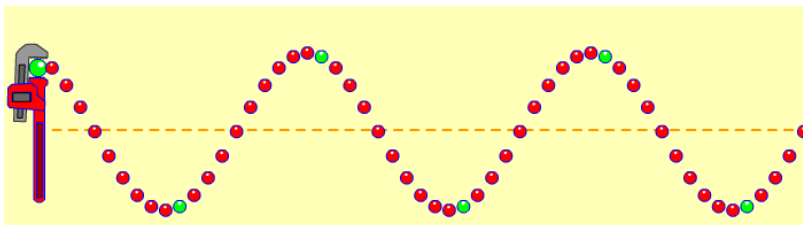
1. What would change if the wave had a higher frequency and smaller amplitude?

Draw how the string would look for a higher frequency, smaller amplitude wave over this picture of the wave:

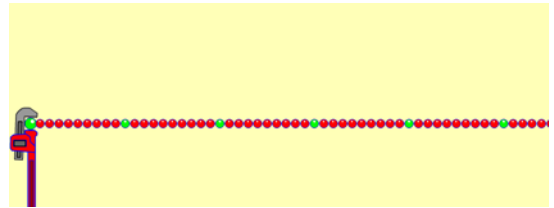


2. What would change if the wave had a lower frequency and larger amplitude?

Draw how the string would look for a lower frequency, larger amplitude wave over this picture of the wave:



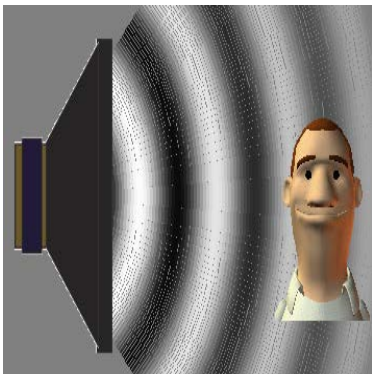
3. If you were to **create a wave by moving the wrench up and down**, describe how you would **move the wrench differently** to make the high frequency, small amplitude wave compared to a low frequency, large amplitude wave?



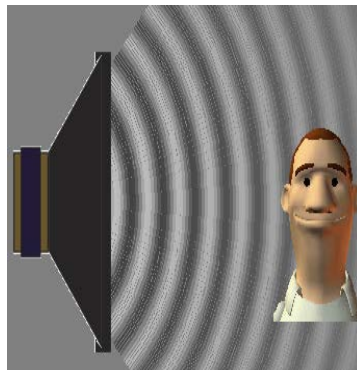
Motion to make a high frequency, small amplitude?

Motion to make a low frequency, large amplitude?

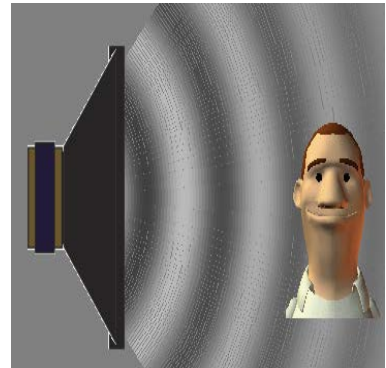
4. A student is listening to some pure notes that are produced using an electronic piano:



A



B



C

- a. Which picture or pictures (A, B, or C) would best show the student listening to a high-pitched sound?

Why do you think so?

- b. Which picture or pictures would best show the student listening to a loud sound?

Why do you think so?

- c. Which picture or pictures would best show the student listening to a low frequency sound?

Why do you think so?

Sound Waves

1. Identify examples of things that make the different types of sounds listed in the table below. **Write your examples in the table.**
2. Open **Sound** simulation from <http://phet.colorado.edu/en/simulation/sound>. 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!

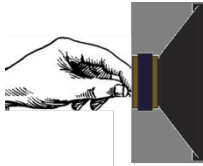


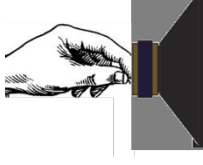
Sound	Example of something that makes this sound	Explain how you used the simulation to make the right noise	Draw what the sound waves look like in the simulation
Case A: Loud, High-pitched			
Case B: Soft, High-pitched			
Case C: Loud, Low-pitched			
Case D: Soft, Low-pitched			

3. Which cases in Question #2:
 - a. Have a high frequency? _____
 - b. Have a large amplitude? _____
 - c. Explain what controls pitch, and what controls loudness.

4. 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 high
pitch?**
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		

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

6. 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?