Student directions *Sound Waves* activity: **Sound homework**
http://phet.colorado.edu 30 minutes

Learning Goals: Students will be able to
- **Explain how different sounds are modeled, described, and produced.**
- **Design ways to determine the speed, frequency, period and wavelength of a sound wave model.**

1. Use the **Listen to a Single Source** tab in *Sound Waves* to start your investigation of sound. Turn on the **Audio Enabled** so you can hear the sound.
   - When you change the frequency, how does the sound change? How does the visual model change?
   - How does changing the amplitude affect the sound and its model?

2. Sound is produced when something vibrates; this movement causes disturbances in the surrounding air pressure. Investigate how the speaker cone moves to produce different sounds. Then, explain the relationships between the movement of the speaker cone and the sound that is made; include drawings to support your explanation.

3. Use the tools on the **Measure** tab to find the speed of sound in air.
   - Make a data table that demonstrates you have a good experiment and show sample calculations.
   - How do your results compare to information that is published? (Include a citation)

4. How could you find the wave length of a sound? Test your idea with several different sounds. Check to see if the results for wavelength make sense. (Include a citation)

5. Describe how you might use the simulation tools to find the period of a wave without using the frequency information.
   - Test your idea with a variety of waves. Check your method by calculating the period using the frequency. Show data and calculations for several trials. Make corrections to the original plan as necessary.

6. Describe how you would find the frequency of a wave if the frequency slider did not have a number display.
   - Test your idea with a variety of waves. Show data and calculations for several trials. Make corrections to the original plan as necessary.