Project FOCUS
Best Lessons
EIGHTH GRADE

Title of Lesson: Sounds and Waves: Tuning Forks
Theme: Physical Science
Unit Number: Click here to enter text. **Unit Title:** Waves, Sound, and Light
Performance Standard(s) Covered (enter code):
S8P4
Click here to enter text.
Enduring Standards (objectives of activity):

Habits of Mind

- ☒ **Asks questions**
- ☐ **Uses numbers to quantify**
- ☒ **Works in a group**

- ☒ **Uses tools to measure and view**
- ☐ **Looks at how parts of things are needed**
- ☒ **Describes and compares using physical attributes**
- ☒ **Observes using senses**
- ☒ **Draws and describes observations**

Content (key terms and topics covered):
Amplitude, intensity, energy, frequency, pitch, longitudinal wave, transverse wave, wave, wavelength, sound, compressions, rarefactions.

Learning Activity (description in steps)
Abstract (limit 100 characters): This experiment uses tuning forks to help students understand key terms and topics in the Waves, Sound, and Light unit. Students work in groups and present their findings to the class. This helps students with their writing and presentation skills.

Details: Use the tuning forks that are mounted onto a wood block. Each group should be supplied with 1-3 tuning forks. Also supply students with a rubber mallet or metal spoon that will be used to strike the tuning forks. Students should be given specific safety instructions before the lab: do not hit tuning forks on the table, yourself, or other students; only use the mallet/spoon to strike the tines of the mallet; do not hold the tuning fork to your ear or other students' ears. Ask the students to strike the tuning forks and to observe what happens. Here are some questions for them to talk about and answer.

1. What do you see happening to the tuning fork while it is making its sound? What do you hear?

2. What does it feel like when you hold the tuning fork and strike it? What causes it to feel like this?

3. What happens to the sound when you bring the tuning fork closer to your ear? DO NOT TOUCH THE TUNING FORK TO YOUR EAR!!!!!

The second part of the lab helps the students learn that sound waves must travel through a solid, liquid, or gas. For this part of the experiment you will use the tuning forks that aren't attached to the blocks of wood. You will need a small bowl of water. I added a little food coloring to the water which helped the students with their observations. Ask the students to strike the tuning fork while holding it.

1. Can we see the vibrations that travel through the air from the tuning fork to your ear? Next, the students will strike the tuning fork again and then place the tips of the tines into the water.

2. What happens to the water when you place the tuning fork into it?

3. What do you think happens to the molecules in the water and air when sound waves travel through them? (Hint: Do the molecules stay still or move?)

I created a worksheet with each of these questions so the students could write their answers in complete sentences. Also, the students presented their findings to the class for about 3-5 minutes. This activity helped them with writing, observation, and presentation skills.

Materials Needed (type and quantity): Tuning Forks from the UGA Science Lab Resource Room, a rubber mallet or metal spoon (metal spoon works the best), handout with the questions listed above and instructions for the lab, bowls (part 2), water, food coloring (optional),

Notes and Tips (general changes, alternative methods, cautions): The PhET simulation listed below helps students review basic vocabulary for the unit. This worked great for students to do in groups. Make sure the safety concerns listed in the "Details" section are made clear to students before beginning the lab. Go over the lab procedures and safety concerns before passing out any materials.

Sources/References:

1) **http://phet.colorado.edu/en/simulation/wave-on-a-string** **(Helps students understand basic unit vocabulary)**

2) Click here to enter text.

3) Click here to enter text.