Interactive Notes-"Sound"

How to Use Interactive Notes- Open the PowerPoint- "Interactive Notes-Sound.ppt". Press the F5 key to begin. Use the spacebar or right arrow to advance. Read the notes below for important teacher information. Give each student a copy of the Interactive Note Sheet.

Materials (per group of 4 students):

Demo 1	1-slinky (item #WW66370M00 at sciencekit.com)
Demo 2	1-wire coat hanger 1-piece of foam block (the kind used to pack electronics into boxes)
Demo 3	1-pyrex flask- steamed and stoppered
Demo 4	2-tuning forks of different frequencies (or a ruler)
…and	4-note sheets

Additional Teacher Materials:

PowerPoint
Hot plates for boiling water and steaming flasks
1 pair-hot gloves
1-funnel- for pouring hot water into flasks
1-meter stick- to refer to when telling students how fast sounds travels

Beforehand:

- Set out all materials *the day before*. Leave yourself time to realize you're missing something, to practice the new demonstrations, research something, or even make a change. In the morning, read through the slides and notes one last time. Relax and have fun along with your students. Remember- you're only as effective as your plan.

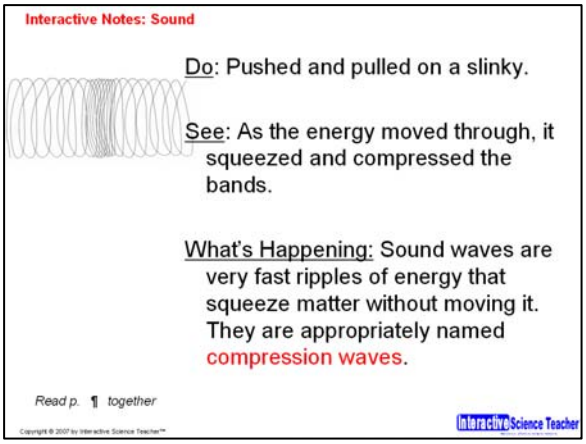
- Keep an extra wire coat hanger and foam block for yourself up front so you can show students how you want them to do demo #2.

- Insert page and paragraph numbers from relevant pages in your textbook at the bottom of slides 1 and 2 if you choose to have the class read from it together. This is a good way to connect with your textbook as well as transition into the next demo. You can also delete these page inserts, or Copy and Paste them onto later slides if needed.

- As with any other demonstration, try these out ahead of time for yourself so you know how they work best and so you know what to expect.

- Print extra copies of the notes pages on paper for yourself, students that are slow writers or can't see well, and for absentees. Click "File" → "Print" → then where it says "Print what:" select "Handouts" → and then "OK".

1.



Tell student #1 (of the 4) to remove the Slinky from the bag and hold onto one end of the Slinky while giving the other end to someone across from or next to them. Have them push on it with varying strength, observing the energy waves moving through, and echoing back. Then pause and ask what they think would happen if waves were sent in from both ends towards each other at the same time. After some suggestions, let them see what happens.

Most students aren't expecting to see the two waves ignore each other and just keep on going, but that's what they do. You could have been nice earlier and had them think about what happens when the rings from two different stones thrown into a pond meet (nothing, they ignore each other as well). Or that if they did interfere, then that means that so do sound waves, which means that two people talking to each other would hear nothing since the sound waves would meet in the middle and cancel out.

You don't need 8 slinkys. Buy 3 or 4 and cut them into smaller sections, which actually helps in 2 ways- less cost, and less chance for tangles. And keep the Slinkys in baggies until the demo. That will keep students from playing with them too early, and lessen even more (but still not eliminate) the chance of them getting tangled.

Sound moves 340 meters per second through air at room temperature. Hold up the meter stick when you say this. Put another way- if you were standing 340 meters away with a drum and banged on it how long it would take you to hear it? (1 second). But you'd see it sooner, because light travels 1,000x faster than sound.

The speed of sound will vary. Sound travels faster when the media is more incompressible and lower in density. For example, it travels 6,000 m/s through granite, but just 54 m/s through rubber. The rubber converts most of the energy to heat.

(end of Teacher Notes preview)

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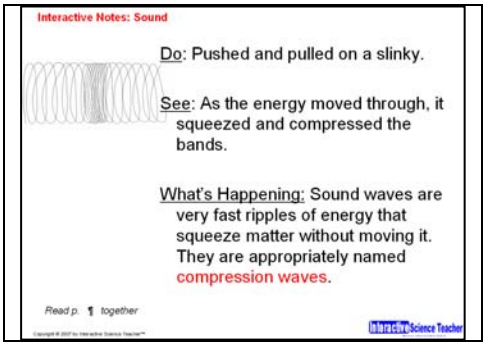
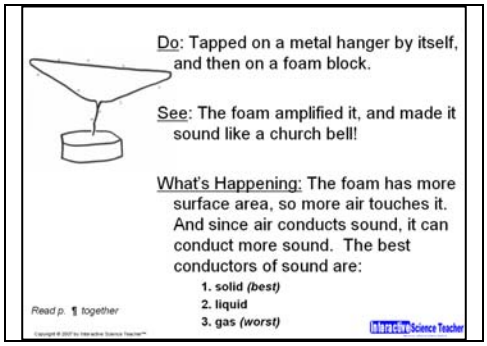
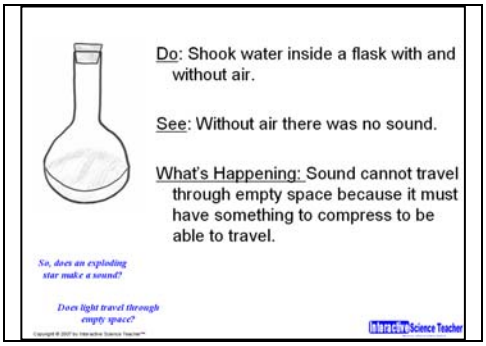
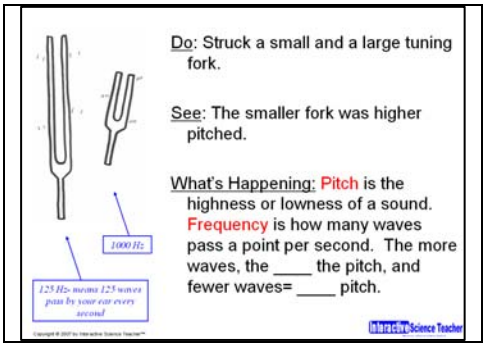
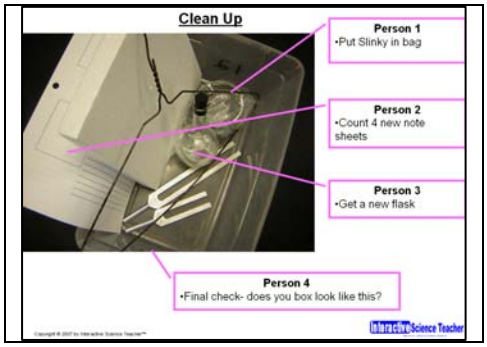


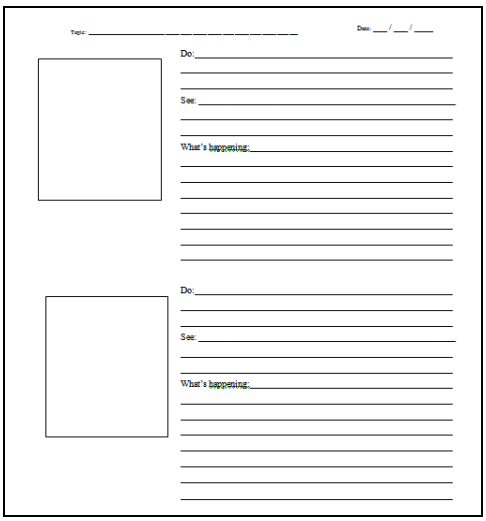








♦ Student Handout



♦ Drawings & Pictures