

Gr. 4 – Understanding Matter and Energy

Light and Sound

Super Listener Earphones

Specific Expectations:

2.1 Follow established safety procedures for protecting eyes and ears.

2.3 Investigate basic properties of sound.

2.4 Use technological problem-solving skills to design, build, and test a device that makes use of the properties of light or sound.

2.6 Use appropriate science and technology vocabulary, including *natural*, *artificial*, *beam of light*, *pitch*, *loudness*, and *vibration*, in oral and written communication.

3.5 Explain how vibrations cause sound.

Big Idea (for lesson):

Students investigate sound through everyday objects, and build a makeshift stethoscope to determine what the source of sound is.

Accommodations:

- Increase time
- Visual Aids
- Manipulatives
- Chunking
- Step-by-Step
- Scaffolding
- Copy of Notes
- Student Grouping

Differentiated Instruction:

- Content: Use demo to show the content as you offer verbal descriptions.
- Process: Have students work in pairs and support each other if physical impediments exist.
- Product: Students may submit their final product in pairs, and communicate their findings either verbally, visually, or through written means.
- Other: _____

Bloom's Taxonomy:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Multiple Intelligence:

- Verbal/Linguistic
- Logical/Mathematical
- Visual/Spatial
- Bodily/Kinesthetic
- Naturalist
- Musical/Rhythmic
- Interpersonal
- Intrapersonal

Delivering The Lesson:

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| Portion & Timing | Grouping: | Introduction: | Materials |
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| <p>Minds On: 10 mins</p> | <p>W <input checked="" type="checkbox"/></p> | <p>S <input type="checkbox"/></p> | <p>I <input type="checkbox"/></p> | <p>Teacher begins by asking students how doctors can tell if certain organs (ie. the heart or the lungs) are working correctly? <i>(Answer: eventually prompt them towards the idea of “listening” for abnormal sounds in the body.)</i></p> <p>-How are sounds produced? <i>(If no one answers something along the lines of “vibrations”, proceed straight to the demo anyways.)</i></p> <p>Teacher does a Predict, Observe, Explain demo with students showing how sound is made. Ask students to predict what will happen when you shake the thunder tube around?</p> <p>-Shake the Thunder Tube around, producing a loud sound.</p> <p>Ask students the following questions: -Why did that happen? <i>(Answer: The coil vibrated, sending sound up and out of the tube.)</i></p> <p>-Based on your observations, what needs to happen for sound to be produced? <i>(Answer: there must be some sort of disturbance or vibration.)</i></p> | <p>-Thunder tube Can be built (http://www.instructables.com/id/Thunder-Maker/) or bought (http://www.stevespanglerscience.com/thunder-tube.html)</p> |
| <p>Action: 20 mins</p> | <p>W <input type="checkbox"/></p> | <p>S <input checked="" type="checkbox"/></p> | <p>I <input checked="" type="checkbox"/></p> | <p>Have students build their own “stethoscopes” according to the instructions on the handout. They then listen to various objects as a partner taps them, following the directions of the handout.</p> <p>Teacher can circulate and ask students what they heard before and after tapping an object, and what they think causes sound.</p> | <p>-Super Listener Earphones Handout (Materials listed)</p> |
| <p>Consolidate: 10 mins</p> | <p>W <input checked="" type="checkbox"/></p> | <p>S <input type="checkbox"/></p> | <p>I <input type="checkbox"/></p> | <p>After the class has established that sound is caused by “tapping” (disturbances/vibrations), they can consolidate by measuring their resting heart rate by following the last directions on the sheet. Ask students what is causing the sound? <i>(Answer: the heart pulsing)</i></p> <p>Is this consistent with what you’ve learned about sound today? <i>(Answer: yes, because</i></p> | |

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| | | | | <i>the heart is essentially vibrating to pump blood through our bodies.</i> | |
| Extension | W <input checked="" type="checkbox"/> | S <input type="checkbox"/> | I <input type="checkbox"/> | -Ask the class if they think that age affects resting heart rate? You can then do an activity where they check the heart rates of different consenting teachers and older/younger students to compare. | |