

NATIONAL SCIENCE EDUCATION STANDARDS

A. Science as Inquiry

Abilities necessary to do scientific inquiry

Understanding about scientific inquiry

B. Physical Science

K–4

Position and motion of objects

- o The position and motion of objects can be changed by pushing and pulling. The size of the change is related to the strength of the push or pull.
- o Sound is produced by vibrating objects. The pitch of the sound can be varied by changing the rate of vibration.

Light, heat, electricity, and magnetism

- o Electricity in circuits can produce light, heat, sound, and magnetic effects. Electrical circuits require a complete loop through which an electrical current can pass.

5–8

Transfer of energy

- o Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.

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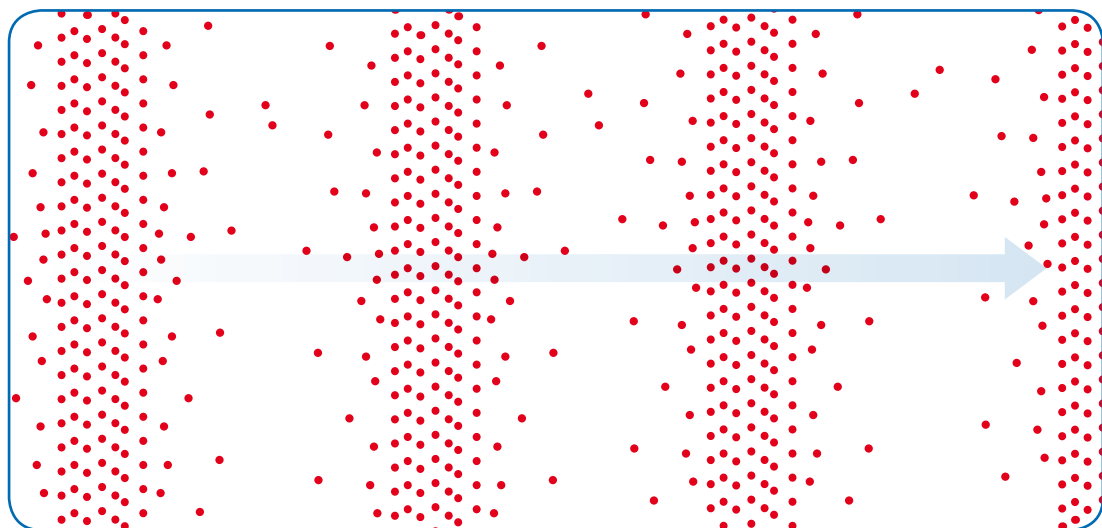
SOUND WAVES

If you're going to help us set up this gear, you need to know a few things.



To begin with, did you know that sound is a form of **energy**? It travels in waves, a bit like the waves on a pond after you've thrown a pebble into it. To get from the speakers to the fans in the crowd, waves of sound

need to move through the air. As a sound wave moves outward, it makes air **molecules** squeeze together and then move apart.



Sound waves pass from one molecule to the next.

Listen to a Reflected Sound

If you'd like to listen to a reflected sound, here's how you can do it.

You will need:

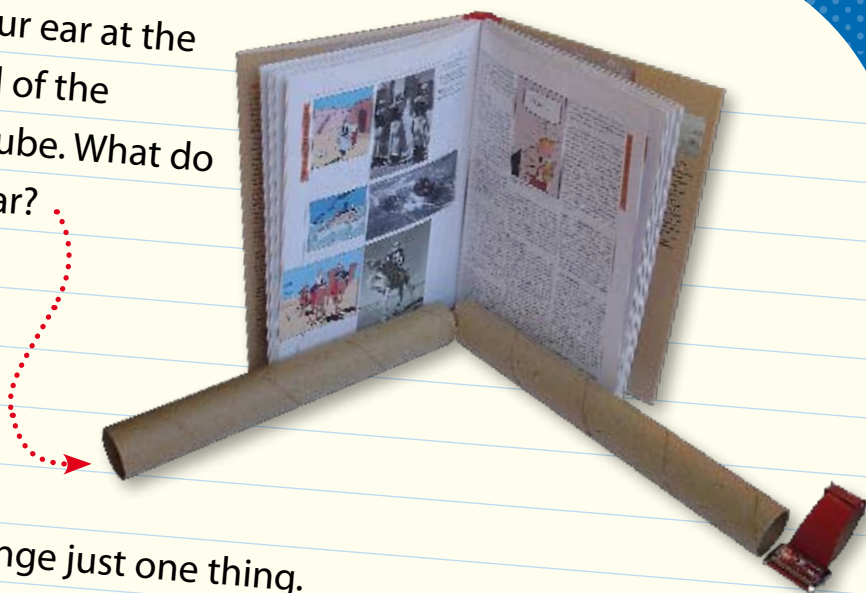
- a hardcover book
- 2 straight cardboard tubes (such as paper towel rolls)
- a watch that ticks
- a folded towel



What to do:

1. Open the book at the center and stand it upright.
2. Lay one tube along the bottom of one side of the book and the other tube along the other side of the book.
3. Put the watch at one end of the first tube.

4. Put your ear at the far end of the other tube. What do you hear?



5. Now change just one thing.
Replace the book
with the towel.



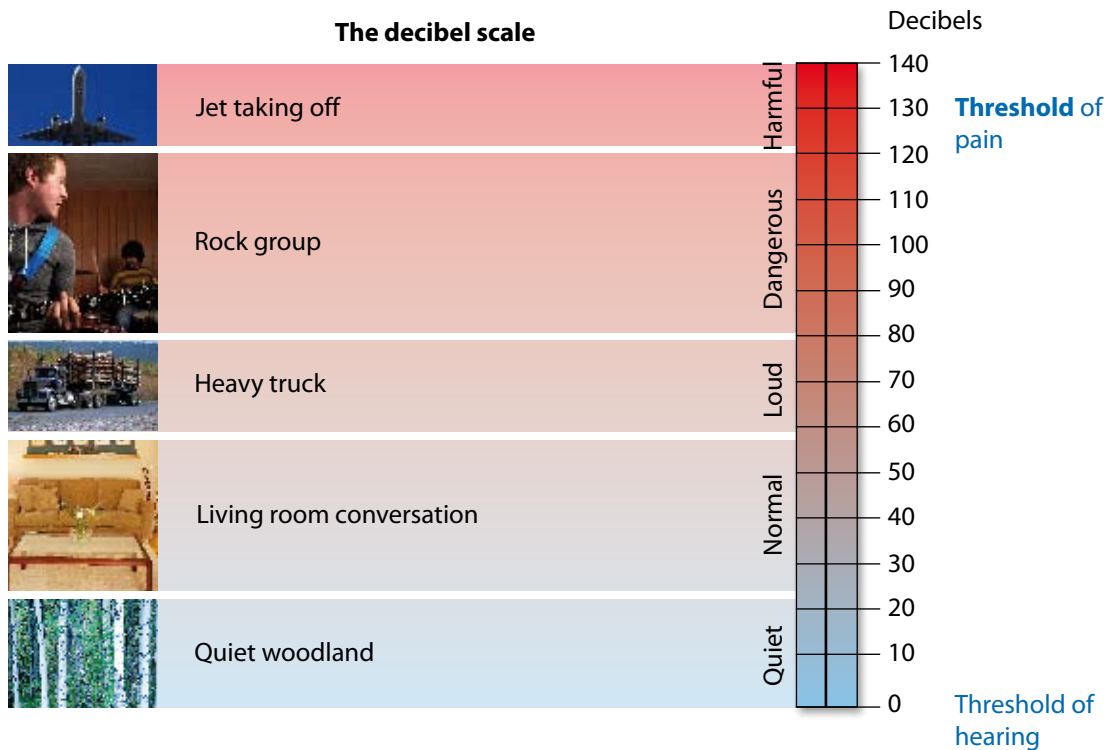
6. What do you hear now?

Show a friend:

Get a friend to listen to the sound of the ticking watch reflected off the pages of the book. Then replace the hard, flat surface of the book with the soft, curved towel. Explain to them that the towel is absorbing the sound waves.

How Loud Is It?

Loudness—or volume—is measured on the decibel scale.



We've got to be careful. If the music's too loud, it will damage the audience's hearing.



Concerts can get up to 120 decibels. That's as loud as a jet engine on a runway! A band called The Who staged the loudest rock concert ever recorded. They reached 126 decibels. Because sound this loud can damage hearing, bands don't usually turn the sound up this high.

