Solid Sound
Investigation #7

Description
Tune up your hearing with this quick and fun investigation!

Materials
- Tuning forks
- Striking hammer or rubber mallet
- Plastic ruler

Procedure
1) Strike the tuning fork with the hammer or mallet and listen.
2) How far can you move the tuning fork away and still hear sound?
3) How would you describe what the tuning fork sounds like?
4) Place the ruler so that it touches your ear. Strike the tuning fork with the hammer again and place the vibrating tuning fork so that its base touches the other end of the ruler.
5) What do you notice?
6) What happens if you place the base of the vibrating tuning fork on different parts of your head?

My Results
Explanation
Although it can be difficult to hear the tuning fork in the air, the sound travels more efficiently through the solid ruler or even when placed against your head. Striking the tuning fork causes a vibration that oscillates, or wiggles back and forth, causing nearby particles to also vibrate. The vibration transfers the energy from particle to particle. If the particles are closer together, like in a solid, they bump into each other much more quickly than if the particles were further apart, like in a gas. The stronger the bonds are between particles, the more the objects keep their shape, so the particles would vibrate and return to their shape more quickly. This is referred to as the elastic properties of an object. Solids have higher elastic properties than liquids or gases, and different solids have different elastic properties. Generally, the higher the elastic properties, the faster sound can travel through it.

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