Funnel Fun
Investigation #5

Description
Amaze your friend with this fun demonstration of how sound travels!

Materials
• 2 funnels or syringes with the plungers removed
• Plastic tubing (2-3 feet in length)
• Pitcher of water
• 440-Hertz tuning fork
• Rubber mallet
• Table
• A friend
• Two ring stands

Procedure
1) Securely slide the ends of the tube over the ends of the funnels, making a watertight seal.
2) Hold the funnels upright so that the tube hangs down. Slowly fill the funnels and tube with water so that the tube is nearly filled but the funnels are not. This can also be done by clamping the funnels or syringes in two ring stands and then filling the system with water. Make sure that the funnels or syringes are level.
3) Have your friend slowly lift one funnel up and cup the funnel over her ear.
4) While holding the other funnel in one hand, strike the tuning fork on the rubber mallet on the table.
5) While the tuning fork is vibrating, insert the base of the fork into the water in the tube, being careful not to touch the funnel itself.
6) What does your friend notice?
7) What happens if you place the base of the fork on the edge of the funnel instead?
8) How do the sounds compare to listening to the tuning fork in the air?

My Results

Explanation
It may surprise your friend to discover she can hear the tuning fork in the water. This is because sound propagates or travels in liquids like water. The sound quality is also affected by the material the sound wave is travelling through. The molecules in liquids are closer together than those in gases so the molecules in liquids can bump into each other much more quickly than the further-spaced particles in gases. That means that sound waves can transfer energy through the liquid particles much more quickly. If sound were traveling at 343 meters per second in air, it would be traveling at 1,480 meters per second in water, and faster still through different solids.

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