

Activity 5

Music to your ears

It is difficult to see, but sound is a form of energy and as a result can cause temporary physical changes to the environment. In this investigation we will see the power of sound at work!

This activity can be demonstrated initially by the teacher. If there is enough equipment, groups can repeat the demonstration and use the evidence and their knowledge to hypothesise what is happening.

YOU WILL NEED A tuning fork (ask the music teacher) • A plastic cup • Water • String •

- 1 Ask the class to be very silent and still!
- 2 Bang the tuning fork on the desk and hold it up to the class.
- 3 Ask students if they can hear anything. Those in the first row should be able to hear a very quiet note.
- 4 They are hearing a sound. Sound is a form of energy. It is made of vibrations travelling through the air.
- 5 When the tuning fork is banged against the table it sets up vibrations in the two prongs. These prongs cause the air around the fork to vibrate and in turn cause air molecules in the room to vibrate.
- 6 These vibrations pass to our ears, vibrating the air against our ear drums. This is picked up by our nervous system, sending a signal to our brain that there is a noise.
- 7 The vibrations of the tuning fork are difficult to see.
- 8 Ask one of the students to come up and assist you to demonstrate the vibrations.
- 9 Fill a small cup almost to the top with water.
- 10 Dip the tuning fork into the water. Is anything happening?
- 11 Bang the tuning fork against the desk and tip the fork against the surface of the water. The vibrations of the fork will cause the water to vibrate and splash your assistant.
- 12 Ask the class to explain what is happening.
- 13 Thread some string through the base of a drinking cup and hang the cup in the air holding it by the string. Bang the tuning fork again and hold it against the cup. The cup begins to vibrate. We can now see the vibrations that are making the sound.
- 14 Bang the tuning fork again and, this time, place the base of the fork on a table. The sound is amplified. Can the class hypothesise why the sound gets louder when you place it on the desk?

Consider this

Why does the water splash out of the cup?

Why does the sound get louder when the tuning fork is placed on the table?

Can you predict why megaphones are cone-shaped from the evidence you have gathered in this investigation?

Tell Me More!

Sound is a form of energy. It is made up of a series of vibrations travelling through the air. Sound travels as waves. A vibration is set up initially by something moving. Your voice is a result of air pushing through your throat and past your larynx, which vibrates the air. Other people's ears pick up these vibrations as your voice.

The sound from the tuning fork is louder when you place it on the desk because, instead of just the air molecules around the fork vibrating, the air molecules that are in contact with the desk are also vibrating; the sound vibrations are amplified.

