# Walking Water

**Target Grade**: K-12. Can be adapted depending on the lesson's main content.

**Time Required**: 10 minutes

**Standards/Topics Covered**:

1-PS4-1: Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

MS-PS4-2: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

MS-PS4-1: Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

**Central Focus:**

In this activity students will have the opportunity to experiment with a tuning fork and observe how sound travels through air. The water will help serve as a visual aid for students when the tuning fork is used in conjunction with it. The waves produced by the vibrations of the tuning fork represent how sound waves travel through the air.

**Background Information:**

Sound is a vibration or wave of air molecules caused by the motion of an object. The wave is a compression wave where the density of the molecules is higher. This wave travels through the air at a speed dependent on the temperature. Teachers should also be aware that sound waves contain energy, thus they will make objects move. If a sound wave hits a solid object, it will bounce back in the direction that it came from. Therefore, producing a sound known as an echo. Sound vibration or sound movement has to happen in order for there to be a sound. When an object vibrates it makes the sound molecules around them vibrate which is what causes a sound to be heard.

**Materials**

- Tuning Fork
- Rubber Cork or Mallet
- Bowl
- Water

**Instructions**

1. Fill the bowl about ¾ of the way full with water.
2. Hit the tuning fork against a rubber cork or mallet.
3. Place the tuning fork into the bowl of water and watch as the water "walks."

**Closure**

1. What happened to the tuning fork after it was hit against the rubber cork or mallet?

   It began to vibrate and created a sound.

2. Why were tiny water droplets dispersed when the tuning fork was placed in the water?

   When the tuning fork was placed in the water, it was vibrating and caused the water it touched to move as well. We can't see the air moving around the vibrating tuning fork before it touches the water, but we can see the splashing of the water molecules once the tuning fork is placed in it.

3. How fast does a sound wave travel through air as compared to its speed in water?

   The waves traveled much slower in the water than through the air because water is more dense than air.