

Good Vibrations

When an object like a coat hanger or a spoon is hung from a string and tapped, it vibrates and makes a sound that we can hear. But there's a lot more that goes into the sound that's made and how well we can hear it. Try this activity for some sound advice.

Materials:

- Wire hanger
- 2 or 3 metal spoons (different sizes)
- String
- Pencil

Procedures:

1. Tie two pieces of string to the coat hanger as shown.



2. Wrap some of the string around the index finger of each hand.
3. Ask a partner to gently tap the hanger with a pencil while you listen to the sound that the hanger makes.
4. Now place the tips of your index fingers in your ears and have a partner gently tap the hanger again. What did you notice?



5. You could make another instrument by hanging different size metal spoons from a string and seeing how they sound when tapped with a pencil.

Think about this ...

To test whether sound travels better through solids than through air, you could try another activity:

1. Seal a zip-closing plastic sandwich bag so that it is about half-full of air. Add sand to another zip-closing plastic sandwich bag until it is about half-full then get as much air out of the bag as possible and seal it.
2. Lay both bags on a desk or table.
3. Place your ear on the bag with air and put the tip of your index finger in your other ear.
4. With your other hand, gently tap the table with the eraser end of a pencil from about an arm's length away. Listen to how well you can hear the tapping.
5. Now do the same thing with the bag of sand. Through which bag can you hear the sound better? What does this tell you about whether vibrations travel better through gases or solids?



Where's the Chemistry?

When the hanger is tapped, the metal vibrates. These vibrations cause the air around the hanger to vibrate. These vibrations in the air reach your ears which allows you to hear the sound. When you put your fingers in your ears, the sound is much easier to hear because vibrations usually travel better through solids like the string and your fingers than they do through gases like air.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

