

Salt Shaker!

If you clap your hands together with a lot of force, you cause a strong vibration and a loud sound. If you clap your hands together gently, you create a less powerful vibration and a quieter sound. The sounds are similar in that they are both claps, but one is louder than the other. In this activity, you can investigate how the strength of vibrations and the volume of sound are related.

Materials:

- Transistor radio (radio where the speaker can face up)
- Wax paper
- Scissors
- Salt

Procedures:

1. Lay the radio down on a table with the speaker facing up.
2. Use your scissors to cut out a small (6cm x 6cm) square of wax paper.
3. Place the wax paper on the speaker.
4. Sprinkle a little salt on the wax paper.
5. Try changing the station and changing the volume to see what type of sounds make your salt dance best!

Think about this ...

The loudness of a sound can be measured in units called decibels. A very quiet sound such as breathing measures about 10 decibels and a loud sound like a jet plane taking off nearby is about 140 decibels. The human ear is sensitive to very loud sounds. In fact, if a person is exposed to sounds above 90 decibels for a long enough time, it can hurt the ear's ability to hear.

For a few examples of sounds and how loud they are in decibels, see the table on the right.

Where's the Chemistry?

The volume of a sound depends on the strength of the vibration. If the radio was playing one note of a certain pitch, the salt would move up and down at a certain speed. If the pitch was kept the same but you increased the volume, the salt would move higher off

the wax paper with each jump. This is because the louder volume was caused by more forceful vibrations.

SOUND	DECIBELS
Normal breathing	10
Rustling leaves	20
Whisper	30
Flowing stream	40
Normal conversation	50-65
Laughter	60-65
Vacuum cleaner	70
Garbage disposal	80
Lawn mower	85-90
NOTE: Prolonged exposure to noise above 90 decibels can cause gradual hearing loss.	90+
Train	100
NOTE: No more than 15 minutes unprotected exposure is recommended.	110
Jackhammer	110
NOTE: Regular exposure for more than 1 minute risks permanent hearing loss.	110+
Rock concert	110-140
Jet plane take-off	130-140



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".

