

Screaming Cup

Grade	4
Topic	<i>Halloween Sounds</i>
Strand/Expectations	<i>Matter and Materials: Materials That Transmit, Reflect, or Absorb Light or Sound</i> <ul style="list-style-type: none">• <i>Investigate, through explorations, ways in which different properties of materials, including their shape, affect the nature of sound (e.g., compare the sound produced by striking solid and hollow materials). 4s26</i>• <i>Identify, using their observations, a variety of materials through which sound can travel (e.g., by ringing bells under water; by sending messages along a string). 4s28</i>

Materials:

- Large plastic cup
- Scissors
- Piece of string 24" long
- Water or Violin rosin (optional)

Procedure:

1. Poke a hole in the bottom of the plastic cup large enough to thread the piece of string through.
2. Thread the string through the hole.
3. Tie a knot or two at the end of the string inside the cup to hold the string in place.
4. Wet the string or coat the string with violin rosin.
5. Holding the cup in one hand, pinch the string between your thumb and forefinger at the base of the cup.
6. Squeeze tight on the string as you slide your thumb and forefinger down the string towards the end (see image right). The string will begin to stick and slide between your fingers causing a screaming sound to occur. With practice making the sound becomes easier.



Scientific Explanation:

Sound is transmitted through the air by vibrations. As you slide your fingers down the string, your fingers stick to and slide along the string. The sticking and sliding happens in short successions and cause vibrations in the string. The violin rosin or water makes the string sticky and increases the sticking and sliding effect which increases the vibrations. The vibrations travel up the string and into the cup, the cup vibrates and the vibrations are amplified as sound by the cone shape of the cup. Larger cups create louder and deeper sounds while smaller cups make softer sounds.

Other Considerations:

- Try differently shaped cups and determine what this change does to the sound – smaller cups make higher sounds than larger cups.
- Use different types of liquids (i.e. milk, juice, vinegar) to observe whether the stick and slide vibration sound occurs.
- Be aware of students in the class who are sensitive to loud noises such as Autistic students – you may want to remove them from the classroom before doing this activity.

References:

Spangler, S. (2007). Halloween sounds – screaming cup. Retrieved October 15, 2007, from <http://www.stevespanglerscience.com/content/experiment/00000081>

Spangler, S. (2007). Singing glasses. Retrieved October 22, 2007, from <http://www.stevespanglerscience.com/experiment/00000086>

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