

Energy and Waves Activity Bag

Energy and Waves: Student Activity Guide

Forms of energy like light, radio, and radiant heat travel through empty space. Other forms of energy, like sound, water waves, and earthquakes travel through substances. All of these travel as waves. In this activity, we will explore energy traveling as a wave.

These directions will get you started. Your teacher will contact you with guidance and information.

Materials From The Bag

- 2 Plastic Cup, 9oz
- 1 Plastic Cup Lid
- 2 Balloons (extras provided)
- 1 Salt Packet
- 1 Deli Tray
- 1 Penny

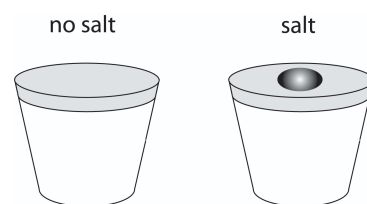
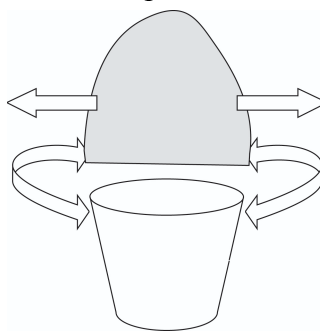
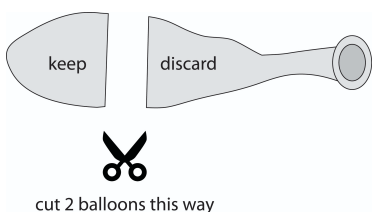
You Will Supply These Materials

- Water
- Scissors

Preparation

Prepare two cups with balloons stretched over them. You will use one cup, without salt, to make noise. The other cup, with salt, will receive it. To make the cups, follow the directions and diagrams below:

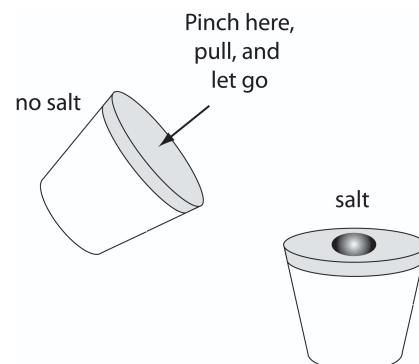
1. Cut the two balloons.
2. Stretch the balloons tightly over the cups.
3. Add salt to one of the cups.



Part 1: Moving Sound - Investigate

1. Lift the **cup without salt** a few inches above the table and hold it 8-10 inches from the cup that has salt on it.
2. Pinch the center of the balloon on **the cup without salt** and stretch the balloon away from the cup.
3. Let go with a snap.
4. Watch the salt grains on the other cup and record your observations.

Where did the energy that moved the salt come from? How did the energy get to the salt? What substance did the energy go through to get to the salt?



Part 2: Moving Sound - Explore

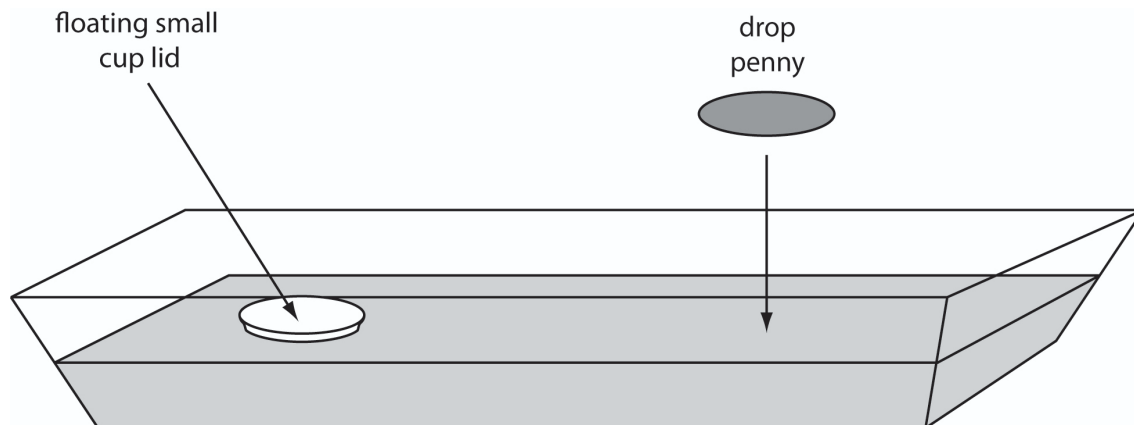
- Using the same setup, explore how sound moves:
 - How far can you space the two cups and still see salt move?
 - Can you set up a barrier to stop the sound from traveling from one cup to the other?
 - What other sounds can you make that will make the salt move?
 - What can you do to make the salt bounce higher? or faster?
- Keep track of the things you tried and your observations

What's happening...

As you stretched the balloon on the cup without salt, you put energy into the balloon. When you snapped the balloon, you released that energy and it became sound energy. The sound energy traveled through the air, as a wave, to the other cup and hit the other balloon. Evidence of the sound waves reaching the balloon can be seen by the salt moving.

Part 3: Waves and Water

- Fill the plastic deli tray $\frac{3}{4}$ full of water.
- Float the small cup lid at one end of the tray.
- When the water is still, drop a penny a few inches above the water.
- Closely watch everything in the tank when you drop the penny and record your observations:



Where did the energy that moved the cup lid come from? How did the energy get to the cup lid? What medium did the energy go through as it traveled?

What's happening...

As soon as you lifted up the penny, you put energy into it. When the penny fell and hit the water, that energy moved into the water and traveled as a wave across the tray. When the wave reached the other end it moved the cup lid.

Part 4: Wave Simulator

To explore waves further, go to this website to use a wave simulator:

https://s3.amazonaws.com/NacreData/waves/project/wave-on-a-string/wave-on-a-string_en.html

Your teacher will share ways to use the wave simulator.