Speed Sinking!

Friction is famous for slowing things down. When objects rub together they can't slide past each other as easily. This activity explores the friction between a peanut and water.

Materials:

- Tall clear plastic container like a tennis ball can or 1-liter soda bottle
- Metric ruler
- Tape
- Watch or clock with second hand
- Peanuts

Procedures:

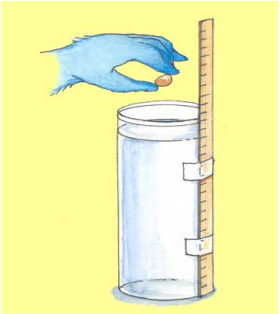
1. Remove the label from your clear plastic container. Tape a ruler to the outside of the container so that the lower numbers are at the top and the higher numbers are at the bottom. The bottom of the ruler should be touching the table.
2. Add water to the container. Try to make the water level line up with a whole number on the ruler like "10" or "12". This will make it easier to figure out the distance the peanut travels from the surface of the water to the bottom of the container.
3. Make a chart like the one shown and get ready to time a peanut as it sinks in the water. Take a whole peanut from the shell and place it on the surface of the water. Time the peanut as it falls. Record the distance and time and calculate the speed.

Peanut Part	Distance	Time	Speed
Whole			
Half			
Quarter			
Tiny Piece			

REMEMBER:

Speed of the peanut = Distance the peanut sinks ÷ Time the peanut took to sink that distance

4. Take another peanut and take the halves apart. Do you think a half-peanut will be a faster or slower sinker than a whole peanut? Let's try it and see! Place the half-peanut on the surface of the water and time it as it sinks. Calculate the speed. Was it faster or slower than the whole peanut?
5. How about if you broke a half-peanut in half and tried a ¼-peanut? How do you think its speed would compare with the ½-peanut and the whole peanut? Predict what you think its speed might be. Try it out!
6. Place the ¼-peanut on the surface of the water and time it as it sinks. Calculate its speed. What did you find out? Now try an even smaller piece and calculate its speed.



Where's the Chemistry?

In the activity, the smaller the piece of peanut, the slower it sinks through the water. The reason for this is a little complicated. Basically, the weight of the peanut causes it to sink but friction from the water on the surface of the peanut slows the peanut down. When you break the peanut in half, the weight of the peanut is reduced more than the amount of surface on the peanut. It has half as much weight but still has more than half of its surface. So as the peanut gets smaller, the effect of friction on the peanut's surface is greater compared to the peanut's weight.

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".