

Activity Name: How Does Soap Affect Surface Tension

Activity Description: Ask students if they have ever seen a water strider (bugs that lives on water) sitting on the surface of a pond. The water molecules "stick" together and form a skin on the surface strong enough to hold up the insect. This is an example of surface tension, the ability of a liquid to stick to itself. Surface tension may be affected by adding soap to the water, and the effect can be measured by comparing the number of drops of plain tap water to the number of drops of soapy water that stick to a penny. If soap increases the surface tension, more drops of soapy water than tap water will stick to the penny, whereas if soap decreases the surface tension, fewer drops of soapy water will stick

Suggested Grade Level / Age Range: 4th or 5th grade

Science Content Covered - Surface Tension

Time needed to complete the activity: 5-10 minutes

Materials Required (per student): a roll of pennies, 2 eye droppers, water, liquid dish detergent, plastic cups for water, a plastic spoon, paper towels, sheets of blank paper, pens/pencils, a black permanent marker

Directions as well as Activity Success Tips for Parents and Teachers:

1. Using a black permanent marker take 4 plastic cups label two with the word "soapy" and two with the word "tap".
2. Pour some tap water into one of the cups labeled "soapy" and one of the cups labeled as "tap". Then add some liquid dishwashing detergent to the first cup labeled "Soapy" that already contains the water and mix thoroughly using a plastic spoon so that there is enough for all the groups to use the same batch.
3. Have separate eye droppers for the tap and soapy water so that no soap gets in the tap water. Do not mix the eye droppers up for different tries of the activity as it will affect the outcome.
4. The second set of empty cups labeled as "soapy" and "tap" will be used to place the pennies in once each student has dropped the water on the penny and the results have been recorded.

5. Divide students into groups of four (adaptable to different numbers of students).
6. Each group will place take a total of 8 pennies. Each student will use 2 dry pennies- one for the "soapy" water and one for the "tap" water. Make sure the remainder of each group's pennies are away from the other pennies that are currently being used.
7. Each student will place his two pennies on two separate paper towels and place them on a flat, dry surface. Students will place one dry penny on paper towel in front of the cup labeled "soapy" and the other dry penny on a paper towel in front of the cup that is labeled "tap" on a paper towel.
8. One student will carefully drop tap water onto the surface of the penny using the eyedroppers, while the others in the group help to count the drops. The student will continue to drop water on the penny until the water begins to run off the penny. The students will then need to record the number of drops of water that the penny held before the water ran off on a sheet of paper.
 - a. It is surprising how many drops the penny will hold before the water begins to run off!
 - b. The student will repeat the same procedures this time using the soapy water on the second penny (remember to use the other eyedropper and soapy water this time)
9. To make sure that the soapy pennies and the tap water pennies don't get mixed up give each student that comes up a two fresh pennies and place the pennies that have already been used in separate plastic cups that were labeled ahead of time.
10. All of the students should have a turn at dropping water onto the pennies.
11. They will then average the numbers of drops that the penny holds for the "tap" and "soapy" water, and compare the results.

Insert Any Images / Photos / Drawings needed to help describe or explain the activity: N/A

Possible follow-up, extension activities or ideas for children and parents to explore (with references or urls):

http://www.ehow.com/how_5115974_make-tension-boat-activity-kids.html

http://educationaltoyfactory.com/surface_tension_experiment.htm

Safety comments / considerations: Do not rub your eyes while conducting experiment since soap is involved.

If your activity should be credited to any specific source or citation -
indicate that here: Websites

http://pbskids.org/zoom/grownups/clubzoom/pdfs/ClubZOOMsci_G_dropspenny.pdf

So we can make sure your organization gets credit for your participation and
we refer people accurately to your organization:

Your Organization's Official Contact Person name & Title: **Christine Royce, Associate
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Your Organizations Web Site: **www.ship.edu**

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