

Water Properties Experiment

Water is essential in every daily function. It is used to help plants grow, nourish our bodies, wash our clothes, our dishes and our dogs, cooking, cleaning and so much more. Water is made up of 2 different types of molecules: two Hydrogen and one Oxygen molecule which is how we get H₂O. This bond is very strong due to **cohesion** and **adhesion**. Cohesion allows the water to stick to itself and will cause a drop of water to stay in place, where adhesion is when water sticks to other things. When molecules on the surface of water are not surrounded by similar molecules on all sides, the cohesion molecules pull stronger than the adhesion molecules so it has a high level of **surface tension** and will stay in place. Water is also the **universal solvent**, meaning many substances dissolve in it. The things that dissolve, like laundry detergent, are **hydrophilic** (water loving), things that don't dissolve in water, like oil, are **hydrophobic** (water hating). When things like minerals dissolve in water we get the difference in hard or **soft** water. **Hard** water contains a lot of minerals like calcium or magnesium but may also contain metals. There is still a lot to be learned about water. During this experiment you will be able to notice how the cohesion, adhesion and surface tension properties work.

Key Terms: Surface tension, Adhesion, Cohesion, Hydrophilic, hydrophobic, hard water, soft water, universal solvent

Objective: Learn about the makeup of water and its properties by putting drops of water on a coin.

Supplies

- Coins of various sizes, Penny, Nickel, Quarter
- Water dropper, straw or anything you can find to help move water droplets
- Water in a cup
- Pencil and paper to record findings

Directions

1. Fill up the cup with water
2. Set out coins on a completely flat surface
3. Fill out the chart with the predictions of how many drops will fit on each coin. Think about different variations and reasons for why the number of drops is what it is.
4. Begin by putting one drop at a time on the penny.
5. Add one more drop at a time and keep track of how many it will hold until it all falls off.
 - a. As you add more, notice how the water drops create a mound and hold on to other molecules

6. Do this 3 times and find the average number of drops a penny can hold.
7. Try with the other coins. How does it differ? What variations do coins have that allow one to hold more or less than the other? Do all pennies hold the same amount of water? What other things besides size affect the number of drops? Be sure to keep track of your predictions and actual results on the chart provided.

coin	Drops prediction	Actual drops
Penny 1		
Penny 2		
Penny 3		
-Average		

coin	Drops prediction	Actual drops
Nickel 1		
Nickel 2		
Nickel 3		
-Average		

coin	Drops prediction	Actual drops
Quarter 1		
Quarter 2		
Quarter 3		
-Average		

Once you have completed this activity, please complete the [Post Activity Evaluation Form](#)

Project Source:

<https://unctv.pbslearningmedia.org/resource/arct14.sci.zpenny/drops-on-pennies/support-materials/>

Information: <https://science.howstuffworks.com/environmental/earth/geophysics/h2o7.htm>