

STEM CHALLENGE



Drops on a Penny Discovering Surface Tension

OVERVIEW

How many drops of water can you fit on top of a penny? Pennies are pretty small and flat. Do you think that water will roll right off the edge? In this activity, you will find out about surface tension as you add water one drop at a time. So how many drops can you fit on top of a penny? Try it and find out!

DROPS ON A PENNY MATERIALS

Penny
Paper Drinking Straw
Paper Towel
Cup of Tap Water*
Dish Soap*

* This item not provided in the kit

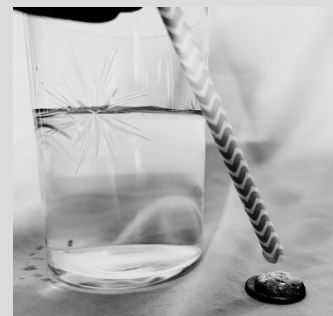
LET'S DO IT: DROPS ON A PENNY

1. Place a penny on top of a paper towel on a flat surface.
2. Insert the drinking straw into the water and cover the top opening with your finger. Lift the straw above the surface of the water and remove your finger from the end of the straw. What happens to the water?
3. Try this again, but this time only lightly lift your finger from the opening. Can you make the water come out of the straw one drop at a time? Try this a few times to practice carefully letting the water out one drop at a time.
4. Once you have practiced your dropping technique, make a prediction or a guess about how many drops of water you can add to the surface of your penny before it spills over.
5. Now add water one drop at a time to your penny and be sure to keep count.

6. Make an observation about what the shape of the water on your penny looks like. How would you describe how the water looks on top of your penny?
7. Keep adding drops and counting until the water spills over.
8. How many drops were you able to place on your penny? How did this compare to your prediction?
9. Dry off your penny and try it again. How many drops fit on top of your penny this time?
10. Do you think you can fit more drops or fewer on the other side of the penny? Dry your penny, turn it over, and try it again.
11. What about another type of coin? A nickel, dime, or quarter?
12. Add a few drops of dish soap to your water. Try it again, but this time with soapy water. How many drops fit on your penny? Was it more or less than tap water?

WHAT'S THE SCIENCE?

Cohesion and surface tension are two properties at work in this activity. Cohesion is the attraction of particles of a substance that causes them to stick together. In this case, it is the molecules of water that like to stick together. Surface tension is a special term we use to describe the cohesion between water molecules that makes the surface "stronger" and can hold together a larger drop....



Drops on a Penny

Discovering Surface Tension



The surface tension of water becomes more visible as the drops of water you add to your penny reach the edge. Once the water reaches the edge of your penny, you start seeing a bubble, or dome, of water form on top of the penny. The bubble shape occurs when the water molecules cling to one another and begin to pile up on the surface of your penny.

Adding soap lowers the surface tension of the water so the drop becomes “weaker” and falls apart sooner. Lowering the surface tension and making water molecules stick together less is what helps soap make it easier to clean your dishes and clothes.

WHAT'S
THE
SCIENCE?
(...continued)

CAREER
PATHWAYS

If you like exploring properties of water, you could be a

- Hydrologist
- Plumber
- Civil Engineer
- Water Distribution/Recovery Operator

READING
CONNECTIONS



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