NAME: PERIOD: DATE:

"How Many Drops Can Fit on a Penny?" Lab

The purpose of this lab is to see the steps of the scientific method in action. You will make a hypothesis and perform an experiment to see how many drops of water can fit on a penny. You will then get results and make conclusions based on the results.

MATERIALS:

Penny Dropper Piece of Paper Container of Soap Container of Water

INTRODUCTION:

Take a look at your penny. You are going to use the dropper to put drops of water onto it. You are familiar with water and with water droplets.

MAKE A HYPOTHESIS:

How many drops of water do you think will sit on top of the penny?

I hypothesize that __________ drops would stay on the penny.

Write a one sentence description of why you think it will be that many in the space below:

EXPERIMENT (PART 1):

1. Don't use soap, but use water and a towel to clean and dry off your penny.

2. Rip a small chunk off the paper that is big enough for the penny to sit on. Put the penny on it.

3. Use a dropper to place as many drops of water on the penny (ONE AT A TIME) until ANY amount of water runs over the edge of the penny. (The dry paper underneath will get wet.)

4. Record the number of drops for that trial on the table below:

TRIAL 1	TRIAL 2	TRIAL 3	TRIAL 4	AVERAGE

5. Repeat steps 1-4 for 3 more trials.

6. Figure out the average drops/trial at the end.

GET & USE RESULTS:

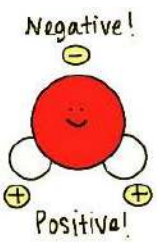
What amount of drops did you hypothesize would sit on the penny? __________ drops

What was the average? __________ drops

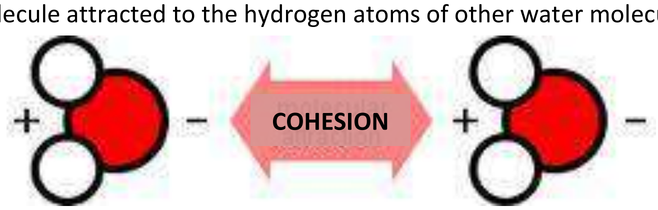
How did the results compare to your hypothesis?

What was the most interesting thing you learned from this experiment?

LIGHT READING:



Water molecules are attracted to other water molecules (kind of like little magnets.) The oxygen atoms have a (-) negative charge, and the hydrogen atoms have a (+) positive charge. This makes the oxygen of one water molecule attracted to the hydrogen atoms of other water molecules. This is called **cohesion**.



This is why the water can stack up into a large "bead" on top of the penny. The water molecules are holding onto each other and not letting each other fall off the penny! When water molecules hold onto each other like this and form a skin it is called s**urface tension**. A water spider can sit on top of pond water because its weight isn't more than the surface tension of the water can hold.

But what if we could get rid of the cohesion?

LIGHT READING (part 2):

Soap molecules have a front which is attracted to water molecules and a back that repels them. This means that the soap gets in the way and keeps water molecules from grabbing onto each other.

MAKE (ANOTHER) HYPOTHESIS:

If there was very little cohesion between water molecules how many drops of water do you think would sit on top of the penny?

I hypothesize that __________ drops would stay on the penny.

Write a one sentence description of why you think it will be that many in the space below:

EXPERIMENT (PART 2):

1. Don't use soap, but use water and a towel to clean and dry off your penny.

2. Using your finger, smear a THIN coating of soap on ONE SIDE of the penny. (It should not be dripping.)

4. Rip a small chunk off the paper that is big enough for the penny to sit on.

5. Put the penny (SOAPY SIDE UP) on the paper.

6. Use a dropper to place as many drops of water on the penny (ONE AT A TIME) until ANY amount of water runs over the edge of the penny. (The dry paper underneath will get wet.)

7. Record the number of drops for that trial on the table below:

TRIAL 1	TRIAL 2	TRIAL 3	TRIAL 4	AVERAGE

8. Repeat steps 1-7 for 3 more trials.

9. Figure out the average drops/trial at the end.

GET & USE RESULTS:

What amount of drops did you hypothesize would sit on the penny? __________ drops

What was the actual average? __________ drops

How did the results compare to your hypothesis?

What was the most interesting thing you learned from this experiment?

What was the independent variable that we tested in the two experiments we did?