

Curiosity Labs™ by Merck:
Bright as a New Penny

in this experiment, you will learn...

- What **acetic acid** is
- What **sodium chloride** is
- What **hydrochloric acid** is
- What causes copper to look dull or dirty
- What a **chemical reaction** is

Share your results and tag us! #SPARKCuriosity

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SUPPLIES

- Dull penny or copper coin (at least 3)
- White vinegar
- Salt
- 3 clear jars or cups
- Measuring spoons
- Paper towels

Instructions

STEP 1

Add a few scoops of salt to first jar (enough to cover the bottom of the jar).

STEP 2

Add some white vinegar to the second jar, enough to cover the bottom of the jar.

STEP 3

Add 3 tbs (45 mL) white vinegar and 1 tbs (15 g) salt in the third jar. Mix it together to create a solution.

STEP 4

Carefully add a dull penny or copper coin to each jar and stir. Watch what happens next!

STEP 5

Carefully remove the coins from each jar and wipe them off with a paper towel.

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FUN FACTS

Vinegar is acetic acid ($\text{HC}_2\text{H}_3\text{O}_2$) and salt is sodium chloride (NaCl). When these two are mixed together, they form a third substance called hydrochloric acid (HCl).

Hydrochloric acid (made from the mixture of salt and vinegar) mixes with the oxygen in copper oxide on the surface of the penny and lifts the dull copper oxide away.



WHAT HAPPENED?

The solution of the salt and vinegar cleaned the dull penny to look like new!

Pennies are made of copper. The air all around us has oxygen in it. The oxygen joins with the copper on the penny leaving it with a film called copper oxide (Cu_2O_2), that looks dull. The experiment created a chemical reaction that cleaned the dull film of copper oxide off the penny. Underneath the dull copper oxide is the clean, shiny copper.