

# Imitating Alchemy

**Grades:** K-5

**Subject:** Chemical reactions  
Alchemy

**Skills:** Measuring, following instructions,  
active listening

**NGSS:** PS1.B: Chemical Reactions

**CCELA:** CCSS. ELA-LITERACY.

**CCRA.R:** Key Ideas and Details

**Materials:** Dull pennies, paper cups, vinegar,  
liquid soap, paper towels

## BACKGROUND

One of the main goals of alchemy, the precursor to chemistry, was to create the “philosopher’s stone.” Alchemists believed that this stone would be able to turn any solids into gold. Scientists no longer believe this to be a worthy pursuit, but chemists are able to create many kinds of change with different chemical reactions. A *chemical reaction* is the change that occurs when different chemical substances interact with each other.

## ACTIVITY

1. Go over the background information with your students.
2. This activity can be done as a demonstration or in groups. Have students guess whether soap or vinegar will clean a penny the best.



3. Place a penny in two cups. Pour soap in one cup and vinegar in the other, making sure both coins are completely covered. Wait at least 10 minutes, then remove the pennies, rinse them in water, and rub them with a paper towel.
4. Compare the pennies and determine if the students guessed correctly at the beginning of the activity.

## HOW IT WORKS

Pennies are mainly made of copper, which grows dull over time from the oxygen in the air. When oxygen and copper mix, they form the dark substance on pennies, which is called copper oxide. Vinegar is an acid, which eats away at copper oxide and leaves the copper surface looking shiny. Soap, unlike acidic liquids, can’t dissolve copper oxides.

## EXPAND THE ACTIVITY

Bring different acidic liquids, such as lemon juice, pickle water, and cola, to test which acid cleans pennies the best. Have students guess which will be the most effective before testing the different juices to find the results. After the pennies have been cleaned, ask students if they think the liquid that worked the best is the most or the least acidic. Another variable to introduce is time. What happens when you leave a penny in the acidic solution for 30 seconds compared to one minute? One hour compared to one day?



This activity is excerpted from the Teacher's Guide to:

*Women in Chemistry*

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