

## Penny Chemistry

**IN IRISH LORE**, leprechauns bury pots of bright gold coins at the ends of rainbows. Of course, leprechauns don't exist, but gold coins do shine!

Have you ever seen a shiny new penny and thought it looked like gold? In a few years, that penny will lose its glimmer. While gold coins stay shiny, old pennies become dull.

When God created everything about 6,000 years ago, he created the world to be made of *elements*. An element is a substance made of just one ingredient that cannot be broken down into smaller ingredients. Some common elements are gold, carbon, oxygen, and copper.

Pennies are made of copper. When copper meets oxygen, a reaction occurs. The copper and oxygen combine to create molecules called copper oxide. This process is called *oxidation* (ox-uh-DAY-shun). Over time, the copper oxide turns pennies from their shiny reddish-brown shade to a dull, dark brown.

But did you know you can clear away the dull layer on a penny and make it shiny again? Let's try it!



I'm **Mr P.**, the host of *Unlocking Science* on Answers TV. Let's have some fun as we investigate God's amazing creation.

## Let's do it!

### What You'll Need

- 2 plastic cups or bowls
- Old pennies
- Paper towel
- 1/4 cup vinegar and 1 teaspoon salt (mixed together)
- 1/4 cup water and a drop of dish soap (mixed together)

### What to Do

1. Put each liquid in its own cup. Label the cups so you know what is in each one.
2. Drop a penny in each cup. Wait 15–20 minutes.
3. Which liquid will clean the pennies the best? Write down your guess.
4. Remove the pennies from the cups. Rinse each penny with water, then gently dry them with a paper towel. Make sure you remember which penny came from which cup.
5. Which liquid shined the pennies better? Did you guess correctly?

### How Does It Work?

Vinegar is an acid. When the vinegar combines with the salt, the reaction can dissolve the copper oxide from a penny. Copper oxide can dissolve in water, but it usually takes a long time.

### Try This!

Gather more pennies and try the experiment again, this time using different liquids. Try using milk, soda, soy sauce, ketchup, or juice. Repeat steps 2–4. Did any of these liquids clean the pennies better than the salt and vinegar? If a liquid cleans well, it probably contains an acid!