

Chapter 21

ENRICHMENT

Use with Section 1

• Describing a Chemical Reaction

Playing with Copper

Pennies aren't made of all copper, but they're part copper. Because of that copper, you can do some pretty amazing chemical experiments with a penny! Here are a few you can try.

Part A

Get a bright shiny penny. Leave it out in the air for a year or so. Then check it out.

What you'll find is that the penny is no longer shiny. Something has caused it to change color. That something is oxygen in the air. The result is a new compound, copper oxide, which is coating the surface of the penny. Write an equation to show what happens.

Hint: You don't really have to do Part A, but you could if you wanted to. Instead, look up *rhetorical* in the dictionary. This is a "rhetorical experiment."

Part B



Put a few pinches of salt in a small bowl, add about 1/4 cup of vinegar, and stir until the salt dissolves. Hold your grungiest penny halfway into this salt/vinegar solution and count slowly to 30. Pull out the penny. Check it out.

The salt and vinegar mixture are a weak acid. Because copper oxide dissolves in acids, the penny becomes bright and shiny wherever the copper oxide was exposed to the acid.

In your own words, describe what happened to the copper oxide.

Part C

Put a square piece of paper towel on a small plate. Put some pennies on the paper towel and pour the salt/vinegar mixture over the pennies. Go read a book, clean your room, or talk on the phone for a couple of hours.

Check it out.

Do you see the bluish-green powder that formed on the pennies? (Some may be on the paper towel, too.) That's the compound malachite. Scientists think that malachite was one of the first metal ores that people learned to mine. You used a weak acid (the vinegar) to "mine" some copper from the penny. The malachite is a combination of copper (from the penny), oxygen (from the air), and chlorine (from the salt). Think about it.

Where else have you seen something that looks like the blue-green copper compound malachite?
