



Polishing Pennies

Scientists and inventors must keep good records of the experiments they conduct. This helps them keep track of what they do and what happens. If they discover something new, they can go back to look at what they did and try it again! They also use the records to help them change and improve the experiment if something does not work.

Complete this worksheet as you go through the steps of your experiment.



Think It

Before beginning an experiment, scientists have a hypothesis, or idea, about what will happen.

In this experiment, you will try to polish old pennies using

- Lemon juice
- Milk
- Cola
- Another liquid of your choice

Make a hypothesis, or guess, about how each liquid will work. Circle your hypothesis.

I think lemon juice will / will not polish the penny.

I think milk will / will not polish the penny.

I think cola will / will not polish the penny.

The other liquid I will test is _____

I think this liquid will / will not polish the penny.



Try It

Now you are ready to test your hypothesis. To conduct the experiment, you will need:

- Four (4) empty cups or glasses
- Lemon juice
- Milk
- Cola
- Another liquid of your choice
- Four (4) tarnished pennies

Follow these steps to find out what happens when you try to polish a penny with different liquids.

1. Before you conduct your experiment, write down what each penny looks like in the “Before” blanks below.
2. Put about an inch of one of the liquids in each cup or glass.
3. Drop a tarnished penny into each glass.
4. Let the pennies sit in the liquids for about 5 minutes.
5. Remove each penny from the liquid.
6. Examine each penny for changes and record what you see in the “After” blanks below.

LEMON JUICE

Before: _____ After: _____

MILK

Before: _____ After: _____

COLA

Before: _____ After: _____

OTHER LIQUID

Before: _____ After: _____

Now it is time to record what happened in your experiment. These are your results.

Which liquid worked the best? _____

Why do you think this liquid polished the penny? _____

Which liquid did not work at all? _____

How is this liquid different from the liquid that did work? _____

Was your hypothesis correct? _____

If you could try another liquid, what would you choose? Why? _____



Explore It

As you learned in this experiment, some liquids polish pennies better than others. Liquids that are good polishers are acids. Liquids that don't work so well are bases. Acids taste sour, while bases taste bitter and feel slippery. Acids also react with some metals to give off hydrogen gas. This is what happens when you drop a penny into an acid. When the metal and acid react, they give off hydrogen which polishes the penny!

You probably have many acids and bases around your home or classroom. Here are a few examples:

Acids	Bases
Lemon juice	Dish soap
Orange juice	Baking soda
Vinegar	Milk of magnesia