We need to make sure we have access to a tap and that we'll be able to use a lighter!!!

Oxidization

Rusting a penny- takes one hour
~~https://sciencing.com/rust-penny-8546741.html~~
http://www.exploratorium.edu/science_explorer/copper_caper.html quicker time frame, use this source

Lemon Juice Invisible Ink
https://www.stevespanglerscience.com/lab/experiments/secret-lemon-juice-messages/
https://www.education.com/science-fair/article/invisible-ink-oxidation/

Basic Outline

1. Start penny corrosion experiment
2. Then, do the invisible ink experiment
3. Explain invisible ink experiment/corrosion
4. Look at penny corrosion after one hour

Supplies Needed

Penny Experiment

- 20 dull, dirty pennies
- 1/4 cup white vinegar
- 1 teaspoon salt
- A clear, shallow bowl (not metal)
- Paper towels
- *Running water- biggest issue*

Invisible Ink Experiment

- Lemon Juice
- Paper
- Q-Tips
- lighter

INTRO

1. **ASK:** What color is the statue of liberty?
    a. If you said green, you're only half right?
        i. Originally, the statue of liberty was the color of a penny!!
    b. Do any of you guys know why, or have any predictions as to why it changed colors?
        i. Before I give you guys an answer, we're going to conduct an experiment.

PENNY EXPERIMENT PT.1

1. This experiment takes about an hour to complete, so we're going to start it right now, and we'll check the results
2. Tell everybody to come up and gather around a central table
    a. Mix salt and vinegar
        i. Stir until it dissolves
    b. Volunteer , get kid to hold a penny half in the mixture, half out of it
        i. Hold for ten seconds
        ii. Ask: what happened?
            1. Ask: Why do you guys think this happened?
    c. Dump all the pennis into the solution
            1. Change will occur during the first 10 seconds
    d. Have a discussion: *this discussion needs to last for five minutes!!!*
            1. What happened when we poured them all into the solution?
            2. Why do you think this happened?
            3. What things in the real world remind you of this?
            4. Do you have any questions about anything?
                a. Make it last!! We have five minutes to kill
    e. Take the pennies out of the solution
        i. Place half of the pennis on a paper towl
            1. Rinse off the other half, place them on a different paper towel
                a. Label towels
    f. Wait one hour before we check on them again
        i. Meanwhile, begin the invisible ink experiment

INVISIBLE INK EXPERIMENT

1. Do you guys like spy movies? James Bond, Austin Power, etc

    a. We're going to create our own secret messages using lemon juice and fire
2. Pass out cups of lemon juice, cotton swabs, sheets of paper
3. Tell them to draw or write anything on the sheets of paper
    a. They can make as many as they want
4. When they're done with their design, bring it up to us, and we'll use the lighter to make they're secret message appear

EXPLANATION

1. **Ask:** What do you all know about chemical reactions?
    a. Take answers
2. Explain a chemical reaction:
    a. **ASK:** Does anyone know what a chemical reaction is?
    b. A chemical reaction is when two or more molecules interact with each other, and create something new
    c. ASK: Has anyone ever baked a cake?
    d. Ingredients to something new
    e. ASK: Can anyone give an example of another chemical reaction?
    f. Similarly to baking a cake or...,
3. What we've been seeing, in the pennies, and in our invisible secret messages, is a chemical reaction
4. First, we'll explain how the penny experiment worked
    a. ASK: What are pennies made out of?
        i. That's right! Along with some other stuff, pennies are mostly made out of copper!
        ii. This copper reacts with the air