Activity Sheet 1
Making a Silvery Penny

1. Clean the penny with the scouring pad until it is shiny all over. (We want the new metal to stick on well!)

2. Using a wire lead with an alligator clip, connect the penny to the NEGATIVE terminal of the battery.

3. Using a wire lead with an alligator clip, connect the nail to the POSITIVE terminal of the battery.

**DO NOT LET THE ELECTRODES TOUCH!**

**PUT ON YOUR SAFETY GLASSES BEFORE USING THE CHEMICALS IN THE NEXT STEP.**

4. Pour Zinc Sulfate solution (ZnSO₄ – 0.5 Molar) to half-fill the container.

5. Place both the penny and nail into the container. Place the penny on one side of the beaker and the nail on the opposite side (see the image below). Watch carefully to see what happens.

![Diagram of setup](image)

You can take the penny out to watch as the coating grows.

6. For fun you could try switching the electrodes. What happens?
Observations:

1. What happened at the positive terminal?

2. What happened at the negative terminal?

3. Can you smell anything while it is running?

4. Does the zinc coating rub off easily?

5. Can you do anything to make the reaction go faster or slower?

6. What happens if you switch the terminals?
Activity Sheet 2
Making a Copper Nickel

1. Clean the nickel with scouring pad until it is shiny all over. (We want the new metal to stick on well!)

2. Using a wire lead with an alligator clip, connect the nickel to the NEGATIVE terminal of the battery.

3. Using a wire lead with an alligator clip, connect the nail to the POSITIVE terminal of the battery.

DO NOT LET THE ELECTRODES TOUCH!

PUT ON YOUR SAFETY GLASSES BEFORE USING THE CHEMICALS IN THE NEXT STEP.

4. Pour Copper Sulfate solution (CuSO₄ – 0.5 Molar) to half-fill the container.

5. Place both the nickel and paperclip into the container. Place the nickel on one side and the nail on the opposite side (see the photo and image below). Watch carefully to see what happens.

You can take the nickel out to watch as the coating grows.

6. For fun you could try switching the electrodes. What happens?
7. **Observations:**

1. What happened at the positive terminal? Is this different from the penny experiment?

2. What happened at the negative terminal?

3. Can you smell anything while it is running?

4. Does the copper coating rub off easily?

5. Is it uniformly distributed?

6. How thick do you think it is?