STEM 101
Powered by THE STEM ACADEMY

Name: _____
Period: _____

UNIT: MEASUREMENT

LIGHT IT UP!

GOAL:

Your goal is to build a working circuit using batteries, wires, and a lightbulb or LED to transfer electrical energy into light!

MATERIALS:

- ✓ Battery pack (with 2 AA batteries installed)
- ✓ LED light or small light bulb
- ✓ Wires with alligator clips
- ✓ Paperclips or foil (for optional switch)
- ✓ Optional: Multimeter (to measure voltage)

STUDENT DIRECTIONS:

Step 1: Build Your Circuit

1. Connect one wire from the **positive (+) side of the battery pack** to one side of the **LED or bulb**.
2. Connect a second wire from the **other side of the LED/bulb** back to the **negative (–) side of the battery pack**.
3. When both connections are complete, the **light should turn on**!

If it doesn't light up, check:

- Are the wires connected tightly?
- Is the LED facing the right direction? (Try flipping it—LEDs have polarity!)

Step 2: Test Energy Transfer

- Watch what happens when the circuit is closed (connected all the way).
- What do you **see**, **feel**, or **hear** that shows energy is moving?

Step 3: Make a Switch (Optional)

1. Disconnect one wire from the battery pack.
2. Insert a **paperclip** or small piece of **aluminum foil** between the wire and the battery terminal.

3. Try **touching or separating** the foil to open or close the circuit—does your light now work like it's on a switch?

Step 4: Use a Multimeter (Optional)

- Connect the multimeter to the battery pack to see how many volts are being sent through the wires.
- Try testing the voltage when the light is **on vs. off**.

Record It:

Observation Prompt	Your Notes
Did your circuit work?	☐ Yes ☐ No
What materials helped transfer the energy?	
What could you improve or add to your design?	
What do you think would happen with more batteries?	

Discussion Prompts:

- What kind of energy did you start with? What kind did you end with?

  _____

  _____

- Why is it important for circuits to be closed (connected fully)?

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  _____

- Where else do you see circuits or switches in real life?

  _____

  _____

Wrap-Up Questions (Discuss or Write):

- Why is it important to measure things in science?

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- What was your favorite tool to use and why?

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- What did you learn about magnets or circuits that surprised you?

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STANDARDS ALIGNMENT

NGSS: 4-PS3-4 **STEL:** STEL 1A, STEL 2A, STEL 4A, STEL 7A, STEL 8A, STEL 11A **CCSS:** CCSS.MATH.CONTENT.3.MD.A.2, CCSS.MATH.PRACTICE.MP2, CCSS.MATH.PRACTICE.MP5, CCSS.MATH.PRACTICE.MP6