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?

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* 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?

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**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