UNIT: Electrical Circuits

Energy Conversion Pit Stop – Powering LEDs

Objective:

Construct a system where chemical energy from a battery converts into light energy.

Materials:

* Battery + holder
* Breadboard or cardboard
* 2 LEDs
* Resistors
* Aluminum foil (optional)
* Switch

STUDENT DIRECTIONS:

**Step 1: Design Your Circuit**

1. Place the battery in the holder.
2. Connect the battery to a breadboard circuit with LEDs and resistors.
3. Add a switch to control the circuit.

**Step 2: Test for Brightness and Resistance**

1. Try using different resistor values (330Ω, 1kΩ, etc.).
2. Note how the brightness changes.

**Record:**

|  |  |
| --- | --- |
| **Resistor Used**  | **Brightness (Low/Med/High)**  |
|   |   |
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**Reflection Prompts:**

* How does the resistor affect the energy conversion into light?

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* Why is managing energy important in real-world devices?

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Standards Alignment

NGSS: HS-PS3-3 STEL: STEL 1E, STEL 2E, STEL 3E, STEL 4E, STEL 5E, STEL 6E, STEL 7E CCSS: CCSS.MATH.CONTENT.HSN.Q.A.1–3, CCSS.MATH.CONTENT.HSA.CED.A.1, CCSS.MATH.CONTENT.HSA.REI.B.3, CCSS.MATH.PRACTICE.MP2, CCSS.MATH.PRACTICE.MP4, CCSS.MATH.PRACTICE.MP5