STEM 101
Powered by THE STEM ACADEMY

Name: _____
Period: _____

UNIT: ELECTRICAL CIRCUITS

# PIT CREW VOLTAGE CHECK – OHM'S LAW IN ACTION

## OBJECTIVE:

Use Ohm's Law to calculate current and resistance in a functioning circuit.

## MATERIALS:

- ✓ Breadboard or circuit tray
- ✓ 9V battery + holder
- ✓ Assorted resistors (100Ω, 330Ω, 470Ω, 1kΩ)
- ✓ 2 LEDs
- ✓ Multimeter
- ✓ Jumper wires

## STUDENT DIRECTIONS:

**Step 1: Build Your Test Circuit**

1. Connect the 9V battery to your breadboard.
2. Place two LEDs in series with one resistor.
3. Use jumper wires to connect the complete circuit.

**Step 2: Measure Current and Voltage**

1. Use the multimeter to measure voltage across the resistor.
2. Use the multimeter to measure current flowing through the circuit.
3. Record your results.

**Step 3: Use Ohm's Law**

Use **V = IR** to calculate the unknown value in your circuit:

- If you know V and R, solve for I.
- If you know V and I, solve for R.

Name: _____
Period: _____

**Record Your Data:**

| Voltage (V) | Resistance (Ω) | Current (A) |
|---|---|---|
| | | |
| | | |
| | | |

**Reflection Prompts:**

- What happens to current if you increase the resistance?

  _____

  _____

- How does this relate to energy flow in a real race bike's system?

  _____

  _____

## STANDARDS ALIGNMENT

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