

## UNIT: ELECTRICAL CIRCUITS

# CIRCUIT PUZZLE CHALLENGE

### OBJECTIVE:

Create a circuit puzzle that only works when all paths are connected correctly.

### MATERIALS:

- ✓ LEDs
- ✓ Buzzer
- ✓ Battery + holder
- ✓ Aluminum foil strips (or tape)
- ✓ Cardboard base
- ✓ Puzzle-shaped paper or cardboard pieces
- ✓ Wires or alligator clips
- ✓ Tape, scissors

### STUDENT DIRECTIONS:

#### Step 1: Create the Circuit Base

- Lay foil strips on cardboard to form your “hidden path.”
- Think like a game designer—leave gaps in the foil path where puzzle pieces will go!

#### Step 2: Make Puzzle Connectors

- Cut paper or cardboard into puzzle pieces that will bridge the gaps in your foil path.
- Tape foil to the bottom of each piece so it conducts electricity when placed correctly.

#### Step 3: Add LEDs and Buzzer

- Connect your circuit using the foil paths, puzzle bridges, battery, LED(s), and buzzer.
- Arrange the pieces so that the circuit is only complete—and works—when ALL puzzle pieces are in the right spot.

#### Step 4: Test It!

- Try placing puzzle pieces one at a time.
- Does the LED light up? Does the buzzer buzz?
- What happens if a piece is missing or upside down?

## Test & Record:

Challenge Attempt	Did It Work?	What Went Wrong (If Anything)?
First Try	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Wrong Piece Used	<input type="checkbox"/> Yes <input type="checkbox"/> No	
All Correct Pieces	<input type="checkbox"/> Yes <input type="checkbox"/> No	

- What was the trickiest part of the puzzle to get working?

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- Can you design a second puzzle for another team to solve?

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## Reflection:

- How does your puzzle model real-world circuit design challenges (like in electronics or machines)?

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- What does this puzzle teach about open vs. closed circuits?

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## STANDARDS ALIGNMENT

**NGSS:** MS-PS3-5 **STEL:** STEL 1B, STEL 2B, STEL 3B, STEL 4B, STEL 5B, STEL 6B, STEL 7B **CCSS:**

CCSS.MATH.CONTENT.6.SP.B.4–5, CCSS.MATH.CONTENT.7.EE.B.3, CCSS.MATH.PRACTICE.MP1, CCSS.MATH.PRACTICE.MP4, CCSS.MATH.PRACTICE.MP5, CCSS.MATH.PRACTICE.MP7