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 | ☐ Yes ☐ No |  |
| Wrong Piece Used | ☐ Yes ☐ No |  |
| All Correct Pieces | ☐ Yes ☐ 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