UNIT: CIRCUITRY GAME

CONDUCTOR VS. INSULATOR SHOWDOWN

Your Mission:

You are testing mystery materials to find out which ones allow electricity to pass through (conductors) and which ones block it (insulators). This helps engineers choose the right materials for wiring and safety!

Focus: Material Properties & Electric Current – How Conductors and Insulators Affect Circuit Flow

Materials:

* Battery pack (AA or 9V)
* Light bulb holder + bulb **OR** LED with resistor
* Alligator clip wires (at least 3)
* Test items:
  + Metal paper clip
  + Plastic straw
  + Cardboard
  + Aluminum foil
  + Rubber band
  + Wooden stick or craft stick

STUDENT DIRECTIONS:

**STEP 1: Build Your Circuit**

* Connect one end of a wire to the positive (+) side of the battery.
* Connect the other end of that wire to the first leg of the light bulb or LED.
* Connect another wire to the second leg of the light.
* Leave the end of that wire open—this is where you’ll test your materials.
* Finally, connect the third wire from the negative (–) side of the battery. This wire also remains open for testing.

**STEP 2: Test Each Material**

* Touch or clip one end of your test material to the open end of the wire from the bulb.
* Touch or clip the other end of the material to the open end from the battery.
* Watch the light! If it turns on, the material conducts electricity.
* If it stays dark, the material is an insulator**.**

**STEP 3: Complete the Data Table**

| **Material** | **Did the Light Turn On?** | **Conductor or Insulator?** |
| --- | --- | --- |
| Aluminum foil | ☐ Yes ☐ No | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Plastic straw | ☐ Yes ☐ No | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Rubber band | ☐ Yes ☐ No | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Reflect and Explain:**

What do all the conductors have in common (look at color, feel, material type)?  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why is it important to know which materials are conductors or insulators in real life?  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Standards Alignment

NGSS:MS-PS2-3 STEL:STEL 1E, STEL 4D, STEL 5E, STEL 7D, STEL 8ECCSS: CCSS.MATH.CONTENT.6.SP.B.4, CCSS.MATH.CONTENT.7.SP.C.7, CCSS.MATH.CONTENT.6.EE.C.9,