STEM 101
Powered by THE STEM ACADEMY

Name: _____
Period: _____

UNIT: MEASUREMENT

MATERIAL DETECTIVE

GOAL:

Use tools and tests to investigate thickness, magnetism, and electrical conductivity of different materials. Learn how physical properties help us choose the right material for a job!

MATERIALS:

- ✓ Ruler or caliper
- ✓ Samples: metal, plastic, wood, paper (labeled or numbered)
- ✓ Magnet
- ✓ Multimeter (set to continuity or resistance mode)

STUDENT DIRECTIONS:

Step 1: Measure the Thickness

1. Use a **ruler or caliper** to measure how thick each material sample is (in **mm or cm**).
2. Record it in your chart.

Step 2: Test Magnetism

1. Gently touch the **magnet** to each material sample.
2. Does the sample **stick to the magnet**?
    - Check the box: ☐ Yes or ☐ No

Step 3: Test Electrical Conductivity

1. Turn the **multimeter** to continuity mode (or resistance, if instructed).
2. Touch the two probes to opposite sides of the sample.
3. Watch the screen or listen for a beep:
    - Beep or low number? ☑ It **conducts electricity**
    - No beep or high number? ✗ It **does NOT conduct**

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Record Your Findings:

Material	Thickness (cm or mm)	Magnetic?	Conducts Electricity?
Metal		☐ Yes ☐ No	☐ Yes ☐ No
Plastic		☐ Yes ☐ No	☐ Yes ☐ No
Wood		☐ Yes ☐ No	☐ Yes ☐ No
Paper		☐ Yes ☐ No	☐ Yes ☐ No

Think & Reflect:

- Which materials might be most useful in building a circuit or structure? Why?

  _____

  _____

- How does knowing the physical properties of a material help engineers?

  _____

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Challenge Question (Wrap-Up):

- Imagine you're designing a race track or a robotic arm. How would accurate measurement help you? How does energy or mass affect how it works?

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STANDARDS ALIGNMENT

NGSS: MS-PS1-2, 2-PS1-1 **STEL:** STEL 3E, STEL 4E, STEL 5F, STEL 6E, STEL 7F **CCSS:** CCSS.MATH.CONTENT.6.SP.B.4, CCSS.MATH.CONTENT.6.RP.A.3, CCSS.MATH.CONTENT.7.EE.B.3, CCSS.MATH.PRACTICE.MP5, CCSS.MATH.PRACTICE.MP6