

C Property Detective Bench

Name: _____

Date: _____

Class: _____

My level: ☐ Explorer ☐ Investigator ☐ Legend

Mission: A mystery sample X was found in the lab. Test known materials with a magnet, an electric circuit, and water. Then use the properties to figure out what sample X is made of.

Big question: How can observable properties identify a material?

★ Warm-up: Two truths and a lie

Two statements are true and one is false. Find the lie and fix it.

A. All metals stick to magnets. B. Wood floats. C. Salt dissolves in water.

A. Copper wires carry electricity. B. Plastic covers wires to keep us safe. C. Rubber is a great conductor.

Key vocabulary	
Property	A trait you can observe or measure, like hardness or magnetism.
Magnetic	Attracted by a magnet (iron, steel, nickel).
Conductor	Lets electricity flow through it; metals are good conductors.
Insulator	Does not let electricity flow (wood, plastic, rubber).
Dissolve	Mix into a liquid so completely you cannot see it.

1 Box 1

Predict

PREDICTION Will the magnet attract the copper wire and the aluminum foil too? They are metals.

☐ Yes, magnets attract all metals ☐ No, only some metals are attracted ☐ Only the foil

Test the other metals

In the simulator: Test the **copper wire** and the **aluminum foil** with the magnet.

You predicted: _____. What did you find?

☐ Only iron was attracted; copper and aluminum were not ☐ All three metals were attracted

☐ None of the metals were attracted

2 Box 2

Property chart

Record the results. Type yes/no, or floats/sinks/dissolves.

Material	Magnetic?	Conducts?	In water
Wood block			
Copper wire			
Salt			

3 Box 3

Conductors vs. insulators

In the simulator: Run the circuit test on at least 5 materials.

Sort the materials by what the bulb did.

Sort: Iron nail · Copper wire · Aluminum foil · Wood block · Plastic spoon · Salt (dry)

Conductor (bulb lit)	Insulator (bulb off)

Why wires are built this way

Electric cords have copper inside and plastic outside. Use your test results to explain why.

- ☐ Copper conducts electricity; plastic insulates so we don't get shocked ☐ Plastic conducts better than copper
☐ Copper is magnetic so it holds the plastic ☐ It is only for color

4 Box 4

Test the mystery sample

In the simulator: Run all three tests on **Mystery sample X**.

Sample X is magnetic, conducts electricity, and sinks. Which material matches ALL of its properties?

- ☐ Iron ☐ Copper ☐ Wood ☐ Salt

5 Box 5

Legend: one test is not enough 🏆 Legend only

If you had ONLY run the circuit test on sample X, could you know it was iron?

- ☐ No. Copper and aluminum also conduct, so more tests were needed ☐ Yes, only iron conducts
☐ Yes, the bulb is always brighter for iron

6 Box 6

Identify sample X (CER)

What is Mystery sample X made of?

Claim Start: "Sample X is..."

Evidence Start: "In my tests, sample X..."

Reasoning Start: "This shows it is iron because..."



Exit ticket: answer the big question in your own words

How can observable properties identify a material?

Completion code:

Shown on the last screen of the simulator.