

Answer Key: Sorting Matter by Its Properties

Grade: 3 **Subject:** Science **For teacher use only** Science

How to use this key

Answers are grouped by section and question number. Many items are open-ended; accept any response that shows correct thinking even if the wording differs. Notes flag where more than one answer is defensible and list common misconceptions to watch for. Estimated grading time: ~4–6 min per packet.

Start Notice & Wonder grade for effort · ~1 min

1 One way to group the rock, spoon, crayon, and ball.

Full credit for any sensible sorting rule. **Samples:** by what they are made of (metal vs. not), by shape (round vs. not), by size, by color, or by "would a magnet pull it." Any on-topic grouping is fine — this warms up the idea of sorting by a property.

2 Pick two objects — one wonder about same/different.

Accept any honest wonder that compares two real objects (e.g., "I wonder if the metal chair is heavier than the plastic one"). Grade for effort and an on-topic idea.

Build Read the Science ~1 min

3 Tool for temperature (Figure 1).

A **thermometer**. Accept "the thermometer box" or a drawing/description of a thermometer. The chart shows temperature is *read* as hot or cold.

Apply Use the Data ~2 min

4 Sort by magnetic + how the table helped.

Only **object 1 (steel paper clip)** is magnetic — the "Magnetic?" column says **Yes** only for row 1. "How the table told me": accept any answer that points to the **Magnetic? column** showing "Yes" for the paper clip and "No" for the rest. *Watch:* students may guess the penny is magnetic because it is metal — see misconceptions.

5 Sort by sink or float.

Float: 2 (wood block) and 4 (plastic cap).

Sink: 1 (steel paper clip) and 3 (penny).

Object 5 (cup of water) has a dash "—" because it is the water itself, not an object dropped in; do not require it in either list. If a student notes "water is the liquid, so it isn't sorted here," that is excellent reasoning.

6 Observation (O) vs. Good guess / inference (G).

- a) **O** — you can see the wood block stay on top.
- b) **G** — a figured-out prediction about a bigger tub you did not test.
- c) **O** — you can see the magnet pull the clip.

Observation = seen or measured directly; good guess (inference) = an idea you figure out or predict.

7 Which property tells the penny (3) and plastic cap (4) apart.

Sink or float. The penny **sinks**; the plastic cap **floats**. (Magnetic and State are the same for both — both "No" and both "Solid" — so those cannot tell them apart.) Full credit for naming sink/float and giving each object's result.

Explain CER (Q8) ~1–2 min

8 Is Ana right that the steel paper clip is the only magnetic object?

Model answer. Claim: Yes, Ana is right — the steel paper clip (1) is the only object a magnet pulls. Evidence: In Table 1 the "Magnetic?" column says **Yes** only for the paper clip; every other object says **No**. Reasoning: A magnet only pulls magnetic objects, so if the table shows "No" for the wood, penny, plastic, and water, a magnet will not pull them — the clip is the only one.

Grade for a claim that matches the data and uses the Magnetic? column as evidence, not for wording. A student who correctly says Ana is right earns full credit with any sound reason from the table.

CER scoring rubric (3 points)

Score	Claim	Evidence	Reasoning
3	States Ana is right (only the clip is magnetic).	Cites the Magnetic? column: "Yes" for the clip, "No" for the rest.	Clearly explains a magnet only pulls magnetic objects.
2	Correct claim.	Evidence is close but vague or partial.	Some correct why, but incomplete.
1	Claim unclear or only "yes/no."	Little or off-table evidence.	Little or unclear reasoning.
0	Wrong or no claim.	No evidence.	No reasoning.

Close ACE ~1 min

ACE Articulate / Connect / Extend.

Articulate: accept any plain-language answer that a property is something you can see, feel, or measure about matter (color, size, mass, magnetic, sink/float, state).

Connect: a floating row is **2 (wood block)** or **4 (plastic cap)**; students should cite the "Sink or float" column showing "Floats."

Extend: any real home object with a testable property (e.g., "a spoon — is it magnetic?"; "a toy boat — does it float?"; "a juice box — is it liquid?"). More than one answer is defensible.

Watch Common misconceptions

- **"All metals are magnetic."** Not true. A magnet pulls iron and steel, but **not** copper (the penny), aluminum, or gold. In Table 1 only the steel clip is magnetic; the copper penny is not.
- **"Big things always sink; small things always float."** Size does not decide sinking. The tiny steel clip sinks and the small plastic cap floats. What matters is the material, not how big it looks.
- **"Bigger means more mass (heavier)."** Size and mass are not the same. A big foam ball can have less mass than a small metal marble. Mass is measured by weighing, not by looking at size.

- **Observation vs. good guess (Q6).** Students often mark a prediction ("it would float in a bigger tub") as something they saw. If you did not actually see or measure it, it is a good guess (inference).

Teacher follow-up based on likely errors

If many students miss Q4, re-anchor "magnetic is not the same as metal" — only iron and steel are pulled, not copper pennies. If Q5 or Q7 shows sink/float confusion tied to size, show two objects where the small one sinks and the big one floats. If Q6 shows observation/good-guess confusion, sort a few statements aloud into "I saw it" vs. "I figured it out." The "all metals are magnetic" idea is the highest-value one to revisit next class.

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