

Substitute Guide: Sorting Matter by Its Properties

Grade: 3 **Subject:** Science **Time:** ~45 min core + ~15 min extension Science

Learning goal (plain language)

Students learn that everything is made of **matter**, and that we can describe and **sort** matter by its **properties** — things we can see, feel, or measure: **mass** (weigh it), **temperature** (thermometer), **magnetic?** (a magnet pulls it), **sink or float** (drop it in water), and **state** (solid, liquid, or gas). They use a chart of five objects to sort them and to explain their thinking from the evidence. **You do not need a science background to run this.** Everything students need is printed in their packet. There are **no lab materials and no hazards** — it is all on paper.

Standards alignment

Framework: 19 TAC Chapter 112 (Grade 3 Science, 2021 TEKS). Focus: classifying matter by measurable and observable physical properties.

- **Provisional SE (classify by properties):** classify matter by observable physical properties such as mass, magnetism, and whether it sinks or floats. verification_status: pending
- **Provisional SE (states of matter):** describe and compare the states of matter — solid, liquid, and gas. verification_status: pending

Provisional — the specific section number and SE codes are pending educator verification against the current official TAC source.

Standards are paraphrased here, not quoted, and this packet does not claim formal alignment to the TEKS. Please confirm the section and codes against your official source.

Setup Before class (5 min)

- Count and hand out one **student packet** per student.
- Confirm each student has a **pencil**. No calculators, computers, or lab items are needed.
- Write the date on the board and remind students to fill in the name line.
- Keep the **answer key** with you — it is a separate file and is **not** in the student packet.

Materials What's needed

- Printed student packet (about 4 pages) per student.
- Pencil per student.
- This guide and the separate answer key (teacher only).
- No technology, no calculator, no lab equipment, no safety hazards.

Timing Suggested pacing (~45–60 min)

Segment	Time	What students do
Start — Notice & Wonder	5 min	Q1–Q2 warm-up

Segment	Time	What students do
Build — Read the science	5–10 min	Read box, word bank, Figure 1; Q3
Apply — Use the data	20 min	Table 1; Q4–Q7
Explain — CER	5–10 min	Q8 claim/evidence/reasoning
Close — ACE	5 min	Articulate / Connect / Extend
Continue — early finishers optional	~15 min	Pick a property, list 3 objects that have it

Script Read aloud to start

"Today's work is a paper science activity called *Sorting Matter by Its Properties*. You will work by yourself with just a pencil — no computers and no supplies. First, do the two warm-up questions. Then read the short box and look at the picture chart. After that, use the table to sort the objects and answer the questions. If a question is tricky, skip it and come back. You may read the words out loud to yourself. Put your name, class, and date at the top now. You have about 45 minutes — raise your hand if you want a word read to you."

Support When students ask for help

- **You may read any part aloud** to a student or the whole class.
- If they are stuck, point them to the **Word Bank** and **Figure 1** — the ideas they need are right there.
- Remind them the chart (Table 1) has all the clues for Q4–Q7. Show them how to read across one row.
- Do **not** give answers; prompt with "What does the table show for that object?" or "Does a magnet pull it — what does the column say?"
- It is fine if a student cannot finish the optional early-finisher task.

Access Accommodations & language support

- **Read-aloud** of any passage or question is allowed for all students.
- Point students to the **sentence starters** and the **Word Bank** (kid-friendly definitions provided).
- Extended time is fine; the core can stop after Q8 if time runs short.
- Students may answer in short phrases or point to a table cell if writing full sentences is a barrier, as long as the idea is clear.
- Drawing is welcome — the early-finisher task invites small pictures.
- The packet is grayscale-safe — it prints and reads clearly in black and white.

Tools Allowed & not allowed

Allowed: pencil, the printed packet, quiet self-read-aloud. **Not needed / not allowed:** calculator (no math required), phones, computers, lab materials.

Collect at the end: Collect every packet, finished or not, with names on them. Stack them for the teacher. Note on a sticky how far most students got and any questions that caused confusion.

Answer key: The **answer key is a separate file** (answerkey.html) and is for the teacher only. Please do not hand it to students.

Teacher follow-up (for the returning teacher)

Watch for two common ideas: that "all metals are magnetic" (the copper penny is not pulled, only the steel clip is) and that "big things sink, small things float" (the tiny clip sinks; the small plastic cap floats). A quick next-day sort of real classroom objects into "magnetic / not" and "sink / float" would reinforce this well. The CER (Q8) responses show who can use a table column as evidence.

Sorting Matter by Its Properties

Grade: 3 **Subject:** Science **Time:** ~45 min + ~15 min extra **Work mode:** By yourself · pencil only Science

Start Here

This is a **paper science activity**. You will look at a picture and a chart, then answer with a pencil. You do **not** need a computer or any supplies. Work by yourself. Do your best. If a question is hard, skip it and come back. You may read the words out loud to yourself.

Start Notice & Wonder 5 min

Think about how you clean up and put things where they go.

1 You dump out a box of things: a rock, a spoon, a crayon, and a ball. You want to **sort** them into groups. Write **one way** you could group them.

2 Look around the room. Pick **two** things. Write **one thing you wonder** about how they are the same or different.

Build Read the Science 5–10 min

Ways to describe matter

Everything around you is made of **matter**. We can describe matter by its **properties**. A property is something you can **see**, **feel**, or **measure**. Here are ones you will use:

- **Mass** — how much stuff is in it. We **weigh** it on a balance. Heavy or light.
- **Temperature** — how hot or cold it is. We measure it with a **thermometer**.
- **Magnetic?** — Does a magnet **pull** it? We hold a magnet near it and watch.
- **Sink or float?** — We drop it in water and **look**. Does it go down or stay up?
- **State** — Is it a **solid** (keeps its shape), a **liquid** (pours and takes the cup's shape), or a **gas** (spreads out to fill space, like air)?

Word Bank

matter

anything that takes up space, like a rock, water, or air.

property

something you can see, feel, or measure about matter.

mass

how much stuff is in an object; we find it by weighing.

magnetic

able to be pulled by a magnet.

solid

matter that keeps its own shape, like a block.

liquid

matter that pours and takes the shape of its cup, like water.

gas

matter that spreads out to fill space, like air.

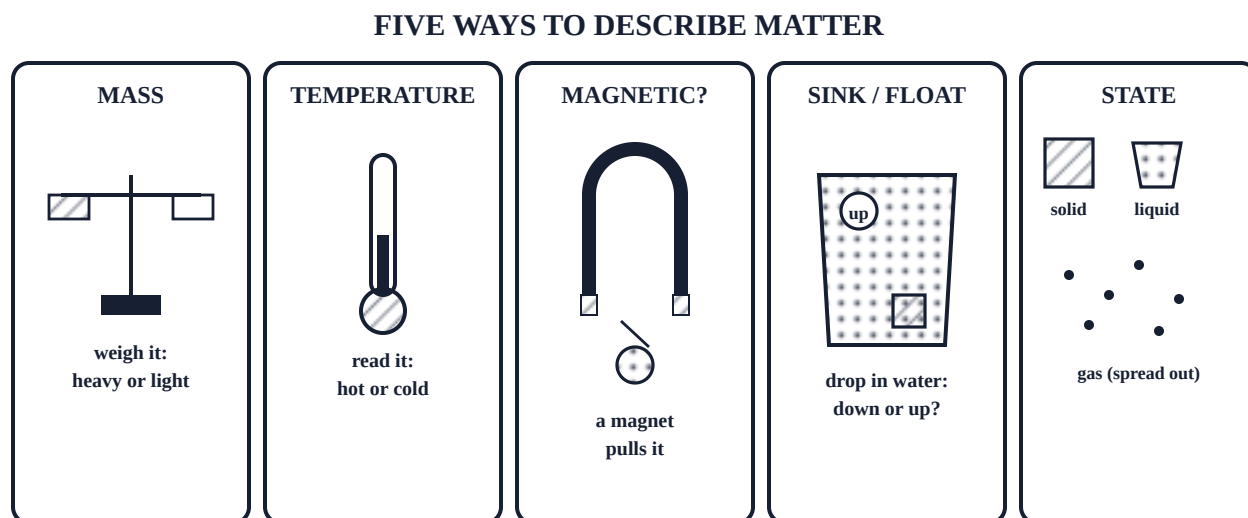


Figure 1. A property chart. Each box shows one **property** and how we **observe or measure** it. The pictures use outlines and patterns (hatching and dots), not colors, so they are clear in black and white.

3Look at Figure 1. Which tool do we use to find **temperature**? Write your answer.

Apply Use the Data 20 min

A class tested five objects and wrote down what they saw. Read Table 1, then answer.

Table 1. Five objects and what the class observed (original class data).

Object	Magnetic? (magnet pulls it)	Sink or float in water?	State
1. Steel paper clip	Yes	Sinks	Solid
2. Wood block	No	Floats	Solid
3. Penny (copper coin)	No	Sinks	Solid
4. Plastic cap	No	Floats	Solid
5. Cup of water	No	—	Liquid

4Sort by **magnetic**. Write the **number** of each object a magnet **pulls**. Then tell how the table helped you know.

Objects a magnet pulls: _____

How the table told me:

5Sort by **sink or float**. Write the numbers of the objects that **float**. Write the numbers of the objects that **sink**.

Float: _____

Sink: _____

6**Observation or good guess?** An **observation** is something you **see** or **measure**. A **good guess** is an idea you **figure out**. Write **O** or **G** for each.

____ a) The wood block stayed on top of the water.

_____ b) The wood block would also float in a bigger tub.

_____ c) The magnet pulled the paper clip.

7Tell them apart. The **penny** (3) and the **plastic cap** (4) are both solids that are not magnetic. Which property in the table tells these two apart? Write it, and tell what each one does.

Explain Claim–Evidence–Reasoning 5–10 min

Question 8. Ana says the **steel paper clip** (1) is the only object in the table a magnet will pull. Is she right? Use Table 1 to explain.

Sentence starters you may use: "My claim is..." · "My evidence from Table 1 is..." · "This shows that..."

Claim (is Ana right?)

Evidence (from Table 1)

Reasoning (why the evidence shows it)

Close ACE Wrap-Up 5 min

Articulate

In your own words, what is a **property** of matter?

Connect

Point to one row of Table 1 that **floats**. Write its number and how you know.

Extend

Name one **thing at home** and one property you could test on it.

Continue Early Finisher optional · ~15 min

If you finish early (no new supplies needed):

Pick one property (magnetic, floats, or solid). On the back of this page, write the property you picked. Then **list 3 objects** from your room or home that have that property. Draw a small picture next to each one.

Turn in: Hand in this whole packet with your name, class, and date filled in. Make sure questions 1–8 and the ACE box are answered. The early-finisher list is optional — turn it in too if you did it.

G03_SCI_MatterProperties_01 — Sorting Matter by Its Properties Student Packet



TEACHER ANSWER KEY FOLLOWS

Do not copy the pages after this divider for students.

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.

G03_SCI_MatterProperties_01 — Sorting Matter by Its Properties Teacher Answer Key