

# Substitute Guide: Classifying Matter by Its Properties

**Grade:** 6 **Subject:** Science **Time:** ~45 min core + ~15 min extension Science

## Learning goal (plain language)

Students learn that every material has **physical properties** — things you can observe or measure (like density, whether a magnet sticks, whether it conducts, how shiny it is, and whether it dissolves) — and that we use those properties to **sort and identify** matter and to tell a **pure substance** from a **mixture**. They practice by reading a diagram and a data table of "unknown" samples, sorting them, and writing a short evidence-based explanation. **You do not need a science background to run this.** Everything students need is printed in their packet, and the samples were already measured for them — there is no lab, no equipment, and no safety hazard.

## Standards alignment

**Framework:** 19 TAC §112.26 (Grade 6 Science). Knowledge & skills **6.6** — the classification of matter by its physical properties.

- **Primary — 6.6A (provisional):** compare and identify substances using physical properties such as density, magnetism, and conductivity.
- **Primary — 6.6B (provisional):** distinguish pure substances from mixtures and classify matter by its physical properties.

Provisional — pending educator verification against the current official TAC source.

(Standards are paraphrased here, not quoted. Please confirm codes and wording 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 (4–6 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                         |
| Build — Read the science                                            | 5–10 min  | Read passage, word bank, Figure 1; Q3 |
| Apply — Use the data                                                | 20–25 min | Table 1; Q4–Q8                        |
| Explain — CER                                                       | 5–10 min  | Q9 claim/evidence/reasoning           |
| Close — ACE                                                         | 5 min     | Articulate / Connect / Extend         |
| Continue — early finishers optional ~15 min "Design a sorting test" |           |                                       |

## Script Read aloud to start

"Today's assignment is a paper science investigation called *Classifying Matter by Its Properties*. You will work by yourself with just a pencil — no computers or calculators, and no lab materials, because the samples have already been measured for you. First read the short passage and study the diagram and the data table. Then answer the questions in order; if one is tricky, skip it and come back. Write in complete sentences where it asks you to explain. You may quietly read the passage aloud to yourself. Put your name, class period, and date at the top now. You have about 45 minutes; raise your hand if you need help understanding a word."

## Support When students ask for help

- **You may read any part aloud** to a student or the class.
- If they are stuck on classifying a sample, point them to the **Word Bank** and to the "metals are usually shiny and conduct" hint printed in Q4.
- Encourage the printed **sentence stems** for the CER (Q9) and ACE sections.
- Do **not** give answers; prompt with "What does the data show for that sample?" or "Which property is different between those two rows?"
- 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 stems** and the **Word Bank** (definitions provided).
- Extended time is fine; the core can stop after Q9 if time runs short.
- Students may answer in phrases if writing full sentences is a barrier, as long as the idea is clear.
- 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 calculation required — densities are read directly from the table), phones, computers, lab materials.

Collect at the end: Collect every packet, whether 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 mix-ups: treating a single property (like "shiny") as proof of what a substance is, and confusing a *mixture* with a chemically joined *compound*. A quick next-day discussion sorting a few real materials

by property, plus reviewing the observation-vs-inference item (Q6), would reinforce this well. The CER (Q9) responses show who can cite specific data as evidence and who understands that a pure substance has the same properties throughout.

G06\_SCI\_ClassifyMatter\_01 — Classifying Matter by Its Properties Substitute Guide