THE STANDARD

Properties of Matter

Make observations and measurements to identify materials based on their properties.

ANCHORING PHENOMENON

Four White Powders That Look Exactly the Same

Four small cups sit on the table, each holding a white powder. By eye they look identical. But one is baking soda, one is salt, one is cornstarch, and one is granulated sugar (table sugar). A drop of vinegar makes one of them fizz like crazy. A drop of iodine turns one of them dark blue-black. Warm water dissolves some fast and one barely at all. Same color, totally different materials.

DRIVING QUESTION

"If four powders look exactly alike, what tests can prove which one is which?"

INVESTIGATIVE 1

Which Stuff Does the Magnet Grab?

Lay out a tray of samples: an iron nail, an aluminum tab, a copper penny, a plastic bead, a steel paperclip. Run a magnet over each. Some leap to it, others ignore it. This sharpens the anchor's big idea: response to a magnet is one property in the fingerprint.

DRIVING QUESTION

"Why does the magnet pull some metals and skip others that look just as metallic?"

INVESTIGATIVE 2

Race to Dissolve

Give each group equal scoops of salt, granulated sugar, baking soda, and sand, plus identical cups of warm water. Stir each one the same number of times. Salt and sugar disappear, baking soda dissolves slower, sand never does. Solubility becomes a measurable, repeatable property that helps separate look-alikes.

DRIVING QUESTION

"If we stir each powder the same way, why do some vanish and one never dissolves at all?"