THE STANDARD

Electric & Magnetic Force Strength

Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

ANCHORING PHENOMENON

The Junkyard Crane

A junkyard crane uses a giant flat disc to lift a stack of car parts. No hook, no chain wrapped around anything. Just the disc, hovering over the metal, and the metal jumps up to meet it. The operator drives the load across the yard, hits a switch, and the whole pile drops. Same disc, totally different behavior depending on whether the switch is on or off. Students will keep circling back to this all week.

DRIVING QUESTION

"What is that disc actually doing, and what would change the size of the pile it can lift?"

INVESTIGATIVE 1

The Balloon That Won't Fall

A balloon rubbed on hair pressed against a wall. It sticks. No tape, no glue, no hook. Just two surfaces and an invisible pull. Walk away, come back in ten minutes, and the balloon is usually still there. Same kind of cause-and-effect logic as the crane, only in slow motion with charge instead of current. Use this one to sharpen the distance-and-magnitude lens the anchor is pushing on.

DRIVING QUESTION

"What's pulling the balloon to the wall, and why does it eventually let go?"

INVESTIGATIVE 2

Magnetism Through a Book

Lay a paperclip on top of a closed textbook. Slide a strong magnet underneath the cover. The paperclip slides across the top of the book, following the magnet you can't see. Add a second textbook on the stack and try again. Sometimes it still works. Add a third, and the paperclip usually stops moving. The force passes through the materials until distance shuts it down.

DRIVING QUESTION

"Why does the magnet still pull the paperclip through a book, and what stops it from working through three?"