THE STANDARD

Gravitational Interactions

Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

ANCHORING PHENOMENON

The Moon Has Been Up There the Whole Time

Show a time-lapse of the Moon crossing the night sky, or a series of photos from the same window at the same time of night across a month. The Moon keeps showing up. It hasn't drifted off into space, and it hasn't crashed into Earth. Something invisible is keeping it on the same path for billions of years. Students will keep circling back to this all week.

DRIVING QUESTION

"What's holding the Moon in place if there's nothing physical connecting it to Earth?"

INVESTIGATIVE 1

High Tide, Low Tide, Same Beach

Two photos of the same coastline six hours apart. Water level dramatically different. Ask students what could move that much water across a whole ocean twice a day, every day, on a perfect schedule. Then drop the hint: the Moon. Use this to sharpen the "gravity works at a distance" lens the anchor is pushing on. The Moon is hundreds of thousands of miles away and still moving oceans.

DRIVING QUESTION

"How can the Moon move that much water from that far away?"

INVESTIGATIVE 2

Drop Two Different Objects At Once

Drop a textbook and a small rubber ball from the same height at the same time. They hit the ground at the same moment. Then watch a clip of the famous hammer-and-feather drop from the Apollo 15 mission on the Moon. No air, same result. Use this to sharpen the "mass and acceleration" facet. Heavier doesn't mean faster falling. Mass matters for gravitational pull, but acceleration near a planet is the same for everything.

DRIVING QUESTION

"If gravity depends on mass, why don't heavier objects fall faster?"