THE STANDARD

Gravity & Our Solar System

Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

ANCHORING PHENOMENON

Jupiter's Moons Moving Night After Night

Through a small telescope (or even good binoculars), Jupiter looks like a tiny pale disk with four bright dots in a line near it. Sketch them tonight. Sketch them tomorrow. The dots are in different positions. Sketch them all week. The dots loop around Jupiter on a schedule. Those are Jupiter's four largest moons, and you're watching gravity do its job in real time. Students will keep circling back to this all week.

> DRIVING QUESTION
>
> *"What's making those moons swing around Jupiter like that, instead of flying off in a straight line?"*

INVESTIGATIVE 1

Planets That Wander Across the Sky

Most "stars" in the night sky stay in the same pattern night after night. A few don't. Mark Venus or Jupiter on a star map this week, then check back in two weeks. They've moved relative to the background stars. That's because they aren't stars at all. They're planets orbiting the sun, and we're watching from another planet doing the same thing. Use this to sharpen the orbital-motion lens the anchor is pushing on.

> DRIVING QUESTION
>
> *"If everything is orbiting the sun, why do some planets seem to wander while the stars stay put?"*

INVESTIGATIVE 2

The Milky Way Stretched Across a Dark Sky

On a really dark night, far from city lights, a hazy band of light stretches across the sky from one horizon to the other. That haze is billions of stars too far to see one at a time. You're looking edge-on into the disk of our own galaxy. The sun is in the disk too, partway out from the center. Same kind of gravity holding all those stars together, only the system is way bigger than the solar system.

> DRIVING QUESTION
>
> *"If we're inside the galaxy, how do astronomers know what it looks like from the outside?"*