THE STANDARD

Gravity in Galaxies & Solar System

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

DCI — DISCIPLINARY CORE IDEA

ESS1.A · The Universe and Its Stars

> *Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe.*

Gravity is the glue. The sun's mass holds the planets in orbit. Planets hold their moons. The Milky Way's combined mass (stars, gas, dust, and dark matter) holds billions of stars in their long orbits around the galactic center. Same force, different scales. Nothing in space is just sitting still. **Everything is falling around something bigger.**

SEP — SCIENCE & ENGINEERING PRACTICE

Developing and Using Models

> *Develop and use a model to describe phenomena.*

Students aren't memorizing planet names. They're building a model that shows what gravity is doing across a whole system. The model has to work at two scales at once: the solar system (sun pulls planets) and the galaxy (collective mass pulls stars). **If the model can describe both, it's doing the work the standard asks for.**

CCC — CROSSCUTTING CONCEPT

Systems and System Models

> *Models can be used to represent systems and their interactions.*

A system has parts that interact. The solar system is a system. The galaxy is a bigger system that contains the solar system. The model students build is a system model. **It shows which parts interact, what's pulling on what, and why the whole thing doesn't fly apart.**