



## Grades 6–8

### 3.3.6-8.B Earth and Space Science: Space Systems

**Students who demonstrate understanding can** *develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.*

**Clarifying Statement:** Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as students' school or state).

**Assessment Boundary:** Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
<b>Developing and Using Models</b> Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. <ul style="list-style-type: none"> <li>Develop a model to predict and/or describe phenomena.</li> </ul>	<b>The Universe and Its Stars</b> <ul style="list-style-type: none"> <li>Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe.</li> </ul> <b>Earth and the Solar System</b> <ul style="list-style-type: none"> <li>The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.</li> <li>The solar system appears to have formed from a disk of dust and gas, drawn together by gravity.</li> </ul>	<b>Systems and System Models</b> <ul style="list-style-type: none"> <li>Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems.</li> </ul> <hr/> <b>Connections to Nature of Science</b> <b>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</b> <ul style="list-style-type: none"> <li>Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.</li> </ul>

**Pennsylvania Context:** N/A

**PA Career Ready Skills:** Analyze various perspectives on a situation.

### Connections to Other Standards Content and Practices

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
<b>Agriculture (AFNR)</b>	CS.02.01.01.b: Analyze and interpret AFNR related geographic data using a variety of systems and technologies (e.g., GIS, GPS, etc.).
<b>Science, Environmental Literacy and Sustainability (NAAEE)</b>	5-8 Strand 1.F. Working with models and simulations: Learners use models to analyze information that support their environmental investigations. They explain the purposes and limitations of these models.



Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Core Standards: ELA	CC.1.5.8.E: Adapt speech to a variety of contexts and tasks.
PA Core Standards and Practices: Math	MP.4: Model with mathematics. CC.2.2.7.B.3: Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
PA Standards: Social Studies	7.1.6.A: Describe how common geographic tools are used to organize and interpret information about people, places, and environment.
Educational Technology (ISTE)	1.6. Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
Technology and Engineering (ITEEA)	STEL-3G: Explain how knowledge gained from other content areas affects the development of technological products and systems.