Science Grade 5 Unit 1

Canterbury Public Schools

Subject	Science
Grade Level	5
Unit Title	Space Systems
Unit Goals	Demonstrate the relationship between the Earth and the Sun and other objects in the Universe.
Pacing (# of weeks)	12 Weeks
Standards	**NGSS Performance Standards** **MS-ESS1-1.** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. **MS-ESS1-2.** Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. **5-PS2-1.** Support an argument that the gravitational force exerted by Earth on objects is directed down. **5-ESS1-1.** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. **5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
Content/Conceptual Knowledge (know)	Science knowledge is based on logical and conceptual connections between evidence and explanations. NGSS Disciplinary Core Ideas (See below) **PS2.B: Types of Interactions:** ● The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1) **ESS1.A: The Universe and its Stars** ● The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1) **ESS1.B: Earth and the Solar System** ● The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in

	the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2) **Disciplinary Core Ideas** **SS1.A: The Universe and Its Stars** ▪ Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1) ▪ Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (MS-ESS1-2) **ESS1.B: Earth and the Solar System** ▪ 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. (MS-ESS1- 2),(MS-ESS1-3) ▪ This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short term, but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS-ESS1- 1) ▪ The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (MS-ESS1-2)
Skills (be able to do)	**Inquiry/Science skills:** ● Observing: Using all five senses to gather information, noting details, and describing objects or events. ● Measuring: Using standard and non-standard measures to accurately quantify dimensions, including the metric system (centimeters, liters, milliliters) ● Inferring: Interpreting or explaining observations to make sense of data. ● Hypothesizing and Testing: Forming a testable, educated guess and designing experiments to test it. ● Controlling Variables: Identifying and managing independent, dependent, and controlled variables in experiments. ● Data Analysis & Interpretation: Creating and reading graphs, charts, and tables to analyze data. ● Modeling: Using models to represent, understand, and explain complex systems. ● Draw conclusions and use data to determine next steps in an attempt to refine the experimentation process. Soft Skills: ● Follow step by step directions ● Communication: Active listening, verbal, and written communication are crucial for collaborating and presenting ideas effectively. ● Teamwork & Collaboration: Working effectively in groups, respecting

	diverse perspectives, and contributing positively to shared goals. ● Adaptability & Flexibility: The ability to adjust to new situations, unexpected challenges, and evolving environments. **Digital Literacy Skills** ● Use Google classroom ● Use technology to complete tasks and research data. ● Use Google sheets to create graphs ● Use Google slides to present data ● Hyperlink data sources
Essential Questions	● Why do the stars change with the seasons? ● Why does the moon change shape? ● What are the predictable patterns caused by Earth's movement in the solar system? ● What makes up our solar system and how can the motion of Earth explain seasons? ● How can the sun tell you the season? ● What is an eclipse? ● How can the motion of the Earth and moon create eclipses? ● What is a constellation? ● Why does day and night occur? ● Why are some stars brighter than others?
Enduring Understandings	The Earth spins once in one day. Sun rise and sun set is due to the rotation of the Earth. As the Earth revolves around the Sun, the seasons change. It also causes us to see different parts of the universe from the surface. Gravity depends on mass. Gravity pulls on everything towards a center point The moon revolves around the Earth and causes it to change shape. The type of star and its distance from Earth are two factors that impact its brightness
Vocabulary	Axis, Waxing, waning, crescent, gibbous,eclipse, lunar eclipse, solar, eclipse, penumbra, umbra, revolution, rotation, solstice, equinox, summer solstice, vernal equinox, winter solstice, autumnal equinox, hemisphere, orbit, gravity, gravitational force, NASA, telescope, asterism, constellation, equator, moon phases, galaxy, universe
Common Learning Experiences	Measuring shadow lengths outside over 2 weeks and graphing the data. Hands on demonstrations Skits that demonstrate the motion of the Earth and Moon to cause moon phases and eclipses

	Creating models that demonstrate Earth's rotation causing day and night Flashlight experiment to show how a beam of light stretches when hitting a surface at an angle to cause seasons. Video demonstrations Research and presentation about a constellation.
Assessments	Pretests Unit Assessments Demonstrations Lab Reports
Student Resources	Classroom library, Google classroom, Mystery Science, online classroom resources Online Super Stem articles
Teacher Resources	NASA.gov, Mystery Science, Scholastic.com, NGSS,