Science
Unit 3: Earth in the Universe

Essential Understandings	▪ The Earth is part of a vast universe. ▪ Cycles occur on Earth.
Essential Questions	▪ What is a universe? ▪ What is in the earth's solar system? ▪ What is a cycle? ▪ What are some physical (non-living) cycles on earth (e.g., water, day and night, phases of the moon, tides)? ▪ What is the water cycle?
Essential Knowledge	▪ Our universe consists of all matter and energy, including the earth and galaxies. ▪ The Earth's solar system consists of a sun, eight planets, their moons and other object. ▪ The Earth, moon, sun, stars, planets, and galaxies have relative positions. ▪ The sun is the only star in our solar system. ▪ Each of the planets revolves around the sun in its own specific path. ▪ It takes 24 hours for the Earth to make one complete rotation on its axis. ▪ The Earth's revolution takes about one year (365 days). ▪ The moon revolves around the earth. ▪ The Earth's rotation causes day and night. ▪ The changing view of the moon is called the moon's phases. ▪ Ocean tides are caused by the pull of gravity between the Earth, the moon, and the sun. ▪ A cycle is a repeated event. ▪ Many changes on Earth occur in cycles. ▪ The seasons are due to the tilt of the earth rotating on its axis. ▪ The same water molecules are being cycled over and over again. ▪ Scientists use tools to conduct investigations, gather data, and answer questions. ▪ Scientists use evidence to develop and communicate theories and understandings.

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Vocabulary	▪ Terms: o cycle, galaxy, universe ▪ Planets: o Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune ▪ Phases of The Moon: o new, waxing (crescent), full, waning(crescent), ocean, tides, gravity, gibbous ▪ Water Cycle: o water molecule, cloud, precipitation, evaporation, transpiration, condensation ▪ Seasons: o axis, tilt, revolution, rotation, hemisphere
Essential Skills	▪ Locate the relative position of the sun, moon and the planets. ▪ Define rotation, axis, and revolution and its relationship with the earth and sun. ▪ Identify some physical (non-living) cycles. ▪ Identify some patterns of change in our solar system. ▪ Explain how the seasons change. ▪ Explain the water cycle. ▪ Make a table or graph to illustrate the phases of the moon or some other pattern. ▪ Plan and conduct an investigation using appropriate tools. ▪ Use data to develop and communicate outcomes.

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Related Maine Learning Results	Science A. Unifying Themes A3.Constancy and Change Students identify and represent basic patterns of change in the physical setting, the living environment, and the technological world. a. Recognize patterns of change including steady, repetitive, irregular, or apparently unpredictable change. b. Make tables or graphs to represent changes. B. The Skills and Traits of Scientific Inquiry and Technological Design B1.Skills and Traits of Scientific Inquiry Students plan, conduct, analyze data from, and communicate results of investigations including fair tests. a. Pose investigable questions and seek answers from reliable sources of scientific information and from their own investigations. b. Plan and safely conduct investigations including simple experiments that involve a fair test. c. Use simple equipment, tools, and appropriate metric units of measurement to gather data and extend the senses. d. Use data to construct and support a reasonable explanation. e. Communicate scientific procedures and explanations. D. The Physical Setting D1. Universe and Solar System Students describe the positions and apparent motions of different objects in and beyond our solar system and how these objects can be viewed from Earth. a. Show the locations of the sun, Earth, moon, and planets and their orbits. D2.Earth Students describe the properties of Earth's surface materials, the processes that change them, and cycles that affect the Earth. a. Explain the effects of the rotation of Earth on the day/night cycle, and how that cycle affects local temperature. b. Describe the various forms water takes in the air and how that relates to weather.
Sample Lessons And Activities	▪ Make a chart of the phases of the moon (chart daily phases). ▪ Make a biosphere using soil, grass seed and water in a 2 liter plastic bottle. ▪ Demonstrate the day/night cycle using models (ex. globe and flashlight).
Sample Classroom Assessment	▪ Sequence the order of the planets starting at the sun. ▪ Illustrate the water cycle. ▪ Using a model demonstrate the movement of the moon and Earth

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Methods	relative to the sun.

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Sample Resources	▪ Publications: ○ Can You Hear A Shout In Space? - Melvin Berger ○ The Children's Space Atlas - Robin Kerrod ○ A Day In Space - Suzanne Lord ○ Is There an Outer Space? - Franklyn Branley ○ The Magic School Bus: Out Of This World - Johanna Cole ○ The Magic School Bus: Lost In The Solar System - Joanna Cole ○ Magic Tree House: Space -William Osborne ○ Magic Tree House: Midnight on the Moon -William Osborne ○ The Moon - Paulette Bourgeois ○ The Moon Book - Gail Gibbons ○ Our Solar System and Beyond - Q.L. Pearce ○ Planet Earth, Inside/Out - Gail Gibbons ○ Planets - Penny Lane Publications ○ The Planets in our Solar System - Franklyn Branley ○ Seeing Stars - James Muirden ○ Solar System - Gregory Vogt ○ Space - Juliette Underwood ○ A Star Is Not A Planet and Other Mix-Ups In Space - Melvin Berger ○ Stargazers - Gail Gibbons ○ Stars and Constellations - Raman Prinja ○ What's Out There? A Book About Space, L. Wilson ▪ Videos: ○ All About The Solar System ○ Exploring Our Solar System ○ Eyewitness Planets ○ The Magic School Bus Gets Lost In Space ○ The Magic School Bus Goes To The Waterworks ○ The Solar System ○ The Solar System A First Look ○ Space, Earth and Atmosphere ○ Sun, Earth, Moon ○ The Universe and Us