Unit 1: Universe (Earth and Physical Science)

Content Area: **Science**
Course(s):
Time Period: **Trimester**
Length: **Trimester**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students explore the Earth, Sun, Moon, and stars using observations of shadows and changing patterns in the sky. Students also explore the planets of our Solar System and begin to consider what might lie beyond.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives and Enduring Understandings:

- Students develop an understanding of patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

Essential Questions:

- How can astronomers measure the distance of a star?
- What is the solar system?
- What patterns can you see in the night sky?
- Why do object always fall downward?

CONTENT AREA STANDARDS

SCI.3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
SCI.3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
SCI.3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
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.
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-PS2-1	Support an argument that the gravitational force exerted by Earth on objects is directed down.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

MA.5.NBT.A.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
LA.RI.5.1	Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
LA.RI.5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
LA.RI.5.8	Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
LA.RI.5.9	Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably.
MA.5.G.A.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
LA.SL.5.5	Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- 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.
- 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
- The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.

Procedural Knowledge

Students will be able to:

- Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
- Represent data in graphical displays to reveal patterns of daily changes in length of shadows.
- Represent data in graphical displays to reveal patterns of daily changes in direction of shadows.
- Represent data in graphical displays to reveal patterns of daily changes in day and night.
- Represent data in graphical displays to reveal patterns of daily changes in the seasonal appearance of some stars in the night sky.
- Support an argument that the gravitational force exerted by Earth on objects is directed down.
- Recognize or recall specific vocabulary.
- Describe the relationship between Earth, gravity, and objects on Earth.
- Plot data about the length and direction of shadows, length of day and night, and seasonal appearance of stars in a graph.
- Identify the distances of different stars (including the sun) from the Earth.
- Describe the apparent brightness of various stars.
- Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
- Integrate (e.g., practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- Reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane.
- Interpret coordinate values of points in the context of the situation.
- Explain patterns in the number of zeros of the product when multiplying a number by powers of 10
- Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.
- Use whole-number exponents to denote powers of 10.

EVIDENCE OF LEARNING

Formative Assessments

- Student predictions, observations, and questions
- Teacher questions and discussion
- Observe students as they apply new concepts and skills
- Evidence of students changed thinking and behaviors
- Open ended questions
- Students answering questions using observations, evidence, and previous accepted explanations
- Students asking related questions that encourage future investigations
- Monitor students working in groups
- Listen to whole class conversations to check for understanding
- Completing tasks
- Recording observations in student journal
- Data charts
- Lab Activities

Summative Assessments

Benchmark Assessments

- Multiple Choice Assessment administered at the end of each trimester (T1, T2, T3)

Alternative Assessments

- Oral Presentations
- Questions for Comprehension
- Performance Tasks
- Scientific Journals/Notebooks
- Self-Assessment
- WebQuests

RESOURCES (Instructional, Supplemental, Intervention Materials)

- Teacher Edition
- Student Lab Manual
- Student Science Notebook
- Graphic organizers
- Videos
- Pictures
- Laptops

- https://docs.google.com/presentation/d/1UqQw69tHSEJ-yB_FoDhkAGfeoXwT0-H5DSFQaWxWPWY/edit#slide=id.g61214bc876_0_0

INTERDISCIPLINARY CONNECTIONS

- Integrate quantitative or technical information expressed in words in a text. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- Social Emotional Learning
- Sustainability

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.

*In addition to IEP Accommodations & Modifications:

- Restate and review directions
- Student restates directions or information
- Oral responses
- Small group/ one to one
- Additional time
- Concrete examples
- Extra visuals
- Support auditory information with visuals
- Space for movement or breaks
- Extra verbal cues and prompts