



<i>Timeline -&gt;</i>	<u><i>Quarter Four (12 lessons)</i></u>
<b><i>Guiding Questions</i></b>	<p><b><u>Science:</u></b>            How do the interactions between the earth, moon and sun produce night and day?            How can we use the scientific method to investigate: moonlight and sunlight, the earth's rotation (day &amp; night), time zones, moon phases and the amount of stars in the Milky Way Galaxy,</p> <p><b><u>Language Arts:</u></b>            What can we learn about our earth, moon, sun and stars by reading?            How can we write to show the steps we have used in the scientific method?            How can adjectives help our written science descriptions?</p> <p><b><u>Math:</u></b>            How can t-charts and data tables help sort items that are different?            How is a bar graph drawn to show totals with provided data?            What conclusions can we draw from the data portrayed by the graph?            How can we use addition, subtraction and grouping (multiplication) to solve problems? How are ratios used to solve problems? How are large numbers represented?</p> <p><b><u>Social Studies:</u></b>            How can we use information to solve a societal problem?            How does geography help us understand time zones?</p> <p><b><u>Art:</u></b>            How can we draw/illustrate and label sketches for a science notebook?            How can we create 3-D models to demonstrate the rotation of the earth and moon?</p>
<b><i>General Learner Outcomes</i></b>	<p><b><u>GLO#1: Self-Directed Learner:</u></b>            Students will create .....</p> <p><b><u>GLO#2: Community Contributor:</u></b>            Students will share</p> <p><b><u>GLO#3: Complex Thinker:</u></b>            Students will use their problem solving, math and writing skills to investigate</p> <p><b><u>GLO#4: Quality Producer:</u></b>            Students will create a final product (poster/diorama/model) that illustrates the</p>



	<p>Students will create math products (graphs, data tables, charts) that enhance posters and diorama.</p> <p><b><u>GLO#5: Effective Communicator:</u></b></p> <p>Students will listen, discuss and record information from their different lessons through oral, written and math pieces that illustrate concepts they have learned about.</p> <p>Students will orally share with younger students their final products.</p>
<p><b><i>Assessments</i></b></p>	<p>Formative and summative textbook assessments.</p> <p>Constructed response (math, language arts, science) that is based on the unit ideas and concepts</p> <p>A summative product rubric will be used to assess the final science poster/diorama/model that each student produces.</p> <p>The rubric criteria will include assessment of the presentation of concepts learned, as well as the written and drawn presentation quality.</p> <p>Oral communication of final project</p>

### ***Standards & Benchmarks***

**Big Idea(s) / Major Understanding(s):** *Students will understand that...*

The sun is the center of the Solar System.

Earth, as part of the Solar System, has 2 major movements: rotation on the axis and revolution in its orbit. (It may seem that the sun is moving but it is the Earth that is moving in its rotation and revolution.)

Earth's mass creates a gravitational force on all objects on earth and its moon.

**Benchmarks:**

- .1.1 **Scientific Inquiry**  
*Describe a testable hypothesis and an experimental procedure*
- .1.2 **Scientific Knowledge**  
*Differentiate between an observation and an inference*
- 7.1 **Forces of the Universe**  
Describe that the mass of the Earth exerts a gravitational force on all objects
- 8.3 **Earth in the Solar System**  
Describe the relationship between the sun and the Earth's daily rotation and annual revolution



## Sample Performance Rubrics

<b>Topic</b>	Scientific Inquiry		
<b>Benchmark SC.4.1.1</b>	Describe a testable hypothesis and an experimental procedure		
<b>Sample Performance Assessment (SPA)</b>	The student: Describes a testable hypothesis (e.g., if, then, because statement) and an experimental procedure to test it.		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Create a testable hypothesis and an experimental procedure to test it	Describe a testable hypothesis and an experimental procedure	Identify, with assistance, a testable hypothesis and an experimental procedure	Recognize, with assistance, a testable hypothesis or an experimental procedure

<b>Topic</b>	Scientific Knowledge		
<b>Benchmark SC.4.1.2</b>	Differentiate between an observation and an inference		
<b>Sample Performance Assessment (SPA)</b>	The student: Observes an object or situation and makes an inference from the observation, describing how they differ		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Explain the difference between an observation and an inference and give examples	Differentiate between an observation and an inference	Provide examples of observations and inferences	Define an observation and an inference

<b>Topic</b>	Forces of the Universe		
<b>Benchmark SC.4.7.1</b>	Describe that the mass of the Earth exerts a gravitational force on all objects		
<b>Sample Performance Assessment (SPA)</b>	The student: Describes that the Earth's gravity attracts objects toward its center without touching them.		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Explain how the mass of the Earth exerts a gravitational force towards its center on all objects	Describe that the mass of the Earth exerts a gravitational force towards its center on all objects	Recognize that the Earth exerts a gravitational force on all objects	Recall, with assistance, that the Earth exerts a gravitational force on all objects

<b>Topic</b>	Earth in the Solar System		
<b>Benchmark SC.4.8.3</b>	Describe the relationship between the sun and the Earth's daily rotation and annual revolution		
<b>Sample Performance Assessment (SPA)</b>	The student: Describes the position of the Earth in relation to the sun during the Earth's rotation and its annual revolution.		
<b>Advanced</b>	<b>Proficient</b>	<b>Partially Proficient</b>	<b>Novice</b>
Use evidence to explain the relationship between the sun and the Earth's daily rotation and annual revolution	Describe the relationship between the sun and the Earth's daily rotation and annual revolution	Identify the Earth's daily rotation and annual revolution	Recognize that the Earth rotates daily and revolves annually around the sun



## Lessons Summary

Lesson Day #	Lesson Title	What students will be able to know, do & understand
Harcourt Text	Chapter 15	Lesson 3: Why is Gravity Important? Pp. 538-539 Read Harcourt reader "Move It" Begin at page 8 and read to end of book. Chapter Assessment: Forces and Motion (page 1) to answer after reading.
Harcourt Text	Chapter 9	PRETEST
AIMS	Dizzy Spells	Students explore why we have daytime and nighttime
AIMS OPTIONAL	IT'S APPARENT	Rubber band book
AIMS (Optional)	Night and Day	How do the lengths of day and night compare?
AIMS	Spin Cycle	Students explore in which direction the Earth spins. Start with a "Hawaiian islands" sticker first and then do the Continental US sticker. Optional lesson: Time Zones their relationship to the Earth's rotation (rubber band book)
Harcourt Text OPTIONAL	Lesson 1: How Do Earth and Its Moon Move?	Inquiry to start – Use "Seasons & Sunlight" investigation p. 307 Debrief the inquiry together as students share results
Harcourt Text	Lesson 1: How Do Earth and Its Moon Move?	Harcourt pages 306-313 Lesson 1 "How Do Earth and Its Moon Move?" Homework RS66-67
AIMS OPTIONAL	Facing Up to the Moon	Dependent on Teacher Prep of Moon Collar Need half day MSP prep session
AIMS OPTIONAL	Lunar Looking	Students explore the changes that the moon goes through over a monthly Note: Find "The Moon Book" by Gail Gibbons Possible Social Studies Connection: Add Hawaiian Lunar Calendar to the backside of the "Lunar Looking Turn-Around" page
AIMS	The Moon Shines Brighter	OPTIONAL
Harcourt Text	Lesson 2: How do Objects Move in our Solar System?	Harcourt p. 314-321 Reading Support Lesson Quick Study RS 68-69



Frameworks for Success in Science – MSP Grant SY 2010-11

WORKING DRAFT COHORT I & II

Ka'ūmana, Hilo Union, Kapiolani, Kalaniana'ole, E.B. De Silva and Ha'aheo Elementary Schools

Content Area: Interdisciplinary/Science

Grade Level: 4<sup>th</sup>

Harcourt Text	Lesson 3: What Other Objects Can be Seen in the Sky?	Harcourt p. 322-329 Reading Support and Homework RS70-71
Harcourt Text	OPTIONAL	Vocabulary Power (analogies)
Harcourt Text	Chapter 9	Post test
AIMS OPTIONAL	Star Tracks	How do the stars move across the sky throughout the year and in one evening?
AIMS OPTIONAL	Stars in the Milky Way	How do scientists estimate the number of stars in the Milky Way?