



Marietta City Schools

District Unit Planner

Grade 4 Science

Theme	<i>Weather and Moon Phases</i>	Unit duration	<i>4 weeks</i>
-------	--------------------------------	---------------	----------------

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GaDoE Standards/3D Science Elements

Georgia Standards:

S4E2. Obtain, evaluate, and communicate information to model the effects of the position and motion of the Earth and the moon in relation to the sun as observed from the Earth.

b. Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full).

S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collected weather data.

a. Construct an explanation of how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data and making forecasts.

c. Ask questions and use observations of cloud types (cirrus, stratus, and cumulus) and data of weather conditions to predict weather events.

Unit Objectives:

Construct a model to show the repeating pattern of moon phases.

Create models of weather instruments and use those instruments to gather data that can predict the weather.

Observe and identify the 3 major cloud types (cirrus, stratus, and cumulus).

Explain how each cloud type can help meteorologists predict the weather.

Unit Phenomena: Show students the [video of a time lapse](#) between winter and summer in Finland. Show students the dates at the bottom and allow them to think about what season that may be here. Allow them to watch for a few minutes. As they are watching, ask them to jot down their observations. The hope is that they will notice that during the summer, it never gets dark. By the end of this unit, they should be able to answer why.

Page Keeley Probes:

Page Keeley probes can be used as phenomena. They are intended to elicit student understanding about science concepts. Starting a unit or lesson with a probe will help you uncover misconceptions and see what students already know about a topic. Using a probe at the beginning of a lesson and then at the end of the lesson serve the purposes of pretesting and then

formatively evaluating student thinking. Below is a list of probes from Page Keeley’s book *Uncovering Student Ideas in Science*, that are appropriate for this unit. This book has been purchased.

What is a Hypothesis? (Volume 3)

Is It a Model? (Volume 4)

Is It a System? (Volume 4)

Gazing at the Moon (Volume 1)

Going Through a Phase (Volume 1)

Emmy’s Moon and Stars (Volume 2)

Rainfall (Volume 3)

Darkness at Night (Volume 2)

Summer Talk (Volume 3)

Camping Trip

Science & Engineering Practices: <ul style="list-style-type: none"> • Asking questions and defining problems • Developing and using models • Analyzing and interpreting data • Constructing explanations and designing solutions 	Disciplinary Core Ideas: <ul style="list-style-type: none"> • Cloud Formation • Weather Instruments • Moon Phases 	Crosscutting Concepts: <ul style="list-style-type: none"> • Patterns • Cause and Effect • Systems and system models
---	---	---

Misconceptions:

Earth’s moon produces its own light.

Lunar phases are caused by Earth’s shadow being cast on the moon.

Clouds all occur at the same height in the Earth’s atmosphere.

Some clouds occur outside of Earth’s atmosphere.

Math/ELA Connections/STEM Connections

ELA Connections:

ELAGSE4RI4: Determine the meaning of general academic language and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

ELAGSE4RI7: Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

ELAGSE4RI10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

ELAGSE4W2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

ELAGSE4W4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

ELAGSE4W7: Conduct short research projects that build knowledge through investigation of different aspects of a topic.

Math Standards

MGSE4.MD.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec.

- a. Understand the relationship between gallons, cups, quarts, and pints.
- b. Express larger units in terms of smaller units within the same measurement system.

Record measurement equivalents in a two-column table.

MGSE4.MD.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

MGSE4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of the comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions by using visual models.

Discovery Education Science Techbook - (Log into your DE account using your Google credentials before accessing these resources.) You will find station rotation activities such as leveled reading passages, interactives, hands-on labs, virtual labs, video clips, and more on the **Explore** page in each Techbook unit.

[About Weather](#)

[Weather Data](#)

[Phases of the Moon](#)

[Cloud Interactives](#)

Hands-on Activities

[Hands-On Activity: Dress for Success](#)

[Learning to Use Scientific Tools: Windsocks, Wind Vanes, and Rain Gauges](#)

[Hands-On Activity: Build a Barometer](#)

[Learning to Use Scientific Tools: Celsius Thermometers](#)

[Learning to Use Scientific Tools: Clocks and Stopwatches](#)

[Hands-On Activity: Choosing a Vegetable Garden Site](#)

[Learning to Use Scientific Tools: Windsocks, Wind Vanes, and Rain Gauges](#)

[Learning to Use Scientific Tools: Compasses](#)

[Hands-On Activity: How's Your Weather?](#)

[Hands-On Activity: Outdoor Temperature](#)

[Hands-On Activity: Outdoor Temperature](#)

[Hands-On Activity: Collecting Weather Data](#)

Essential Questions

Factual—

What are the phases of the moon?

How are moon phases related to Earth’s tides?

How do meteorologists predict weather conditions?

Inferential—

Are the phases of the moon observed the same for all over the world? Why or Why not?

Describe each step of cloud formation.

Critical Thinking-

How do we know the phases of the moon are accurate?

Should the ISS expand to host more astronauts in space during rotations?

Tier II Words- High Frequency Multiple Meaning	Tier III Words- Subject/ Content Related Words
thermometer, wind, moon, weather, clouds	new moon, crescent moon, gibbous moon, full moon, quarter moon, rain gauge, barometer, wind vane, and anemometer, cirrus, stratus, cumulus, climate

Teacher Resources These resources are intended to support teachers with background information and planning for instruction
<i>The following Knowledge-Based Unit contains instructional read alouds designed to build knowledge around concepts associated with this planner. Highlighted lessons provide direct text-based support for the expectations of the associated SS or Sci standards and could be used to deepen student understanding/application of those standards. The remaining lessons build similar knowledge but do not directly relate to the content standards.</i>

[15-Day Plan: Patterns and Effects of Weather and Climate](#)

[GaDOE Inspire Science 4th Grade: Weather and Moon Phases](#)

Objective or Content	Learning Experiences	Differentiation Considerations
CLE 1-2: S4E2. Obtain, evaluate, and communicate information to model the effects of the position and motion of the Earth and the moon in relation to the sun as observed from the Earth. S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collected weather data.	<u>Earth Science: Weather and Space</u> In this Georgia DOE 5E lesson, students begin the data collection of weather and moon phases. This segment will have students begin the process of collecting and analyzing weather data in order to predict the weather for their local area. Students will also begin collecting and recording observations of the moon phases to recognize the repeating pattern.	Student Choice Performance Tasks Reflection and Goal Setting Learning Stations Choice Boards Formative Probes Science Journaling Multi-sensory activities Assistive Technology Flexible Grouping Multiple Means of Representation
Recommended High Quality Complex Text By Lexile Band		
<i>The Moon's Cyclical Phases: Understanding the Relationship Between Earth, Sun and Moon</i> by Baby Professor <i>The Faces, Err Phases, of the Moon</i> by Baby Professor <i>Everything Weather</i> by National Geographic <i>Weather Watch: Forecasting the Weather</i> by Ellen Labrecque <i>Those Clouds Sure Look Fluffy!</i> By Baby Professor <i>The Moon Book</i> by Gail Gibbons		