

Feb. Unit 3C: Phases

Content Area: **Science**
Course(s):
Time Period: **February**
Length: **2 weeks**
Status: **Published**

Unit Overview

The moon waxes and wanes—appears to grow larger and smaller—during the course of a month. The moon’s size remains constant, but its changing position creates the different sunlit portions we see on Earth. In this concept, you will learn about the different phases of the moon.

Enduring Understandings

- **Lesson Objectives**

By the end of the lesson, students should be able to:

- Describe the patterns of the appearance of the moon in the sky.
- Describe the motion of the moon in space.
- Explain the lunar cycle.

Essential Questions

- **Overarching Question**

- What is the universe, and what is Earth’s place in it?

- **Focus Question**

- What are the predictable patterns caused by Earth’s movement in the solar system?

- **Lesson Questions**

- How does the appearance of the moon in the sky change over time?
- How does the moon move in space?
- Why does the moon have different phases?

- **Can You Explain?**

- Why do we see different shapes of the moon from Earth?

Instructional Strategies & Learning Activities

- [The Five E Instructional Model](#)

Science Techbook follows the 5E instructional model. As you plan your lesson, the provided Model Lesson includes strategies for each of the 5Es.

- [Engage \(45–90 minutes\)](#)

Students are presented with the phenomena of the moon’s phases, as seen from Earth. Students begin to formulate ideas around the Can You Explain? (CYE) question.

- [Explore \(90 minutes\)](#)

Students investigate questions about the causes and effects of the moon’s movement in space. Students complete a Hands-On Activity and put the lunar phases in order.

- [Explain \(45–90 minutes\)](#)

Students construct scientific explanations to the CYE question by including evidence of how the moon moves around Earth as the sun shines on it.

- [Elaborate with STEM \(45–90 minutes\)](#)

Students apply their understanding of the phases of the moon as they learn about a lunar calendar’s role in society, investigate how moon phases affect fishing, and design a new product based on nature.

- [Evaluate \(45–90 minutes\)](#)

Students are evaluated on the state science standards, as well as Standards in ELA/Literacy and Standards in Math standards, using Board Builder and the provided concept summative assessments.

Integration of Career Exploration, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.

CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.
TECH.9.4.8.CT	Critical Thinking and Problem-solving
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally. Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others. Multiple solutions often exist to solve a problem. Increases in the quantity of information available through electronic means have heightened the need to check sources for possible distortion, exaggeration, or misrepresentation. Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking. An individual's strengths, lifestyle goals, choices, and interests affect employment and income. Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.

Technology Integration

Technology is fully integrated with the Discovery Techbook

Interdisciplinary Connections

LA.6-8.CCSS.ELA-Literacy.CCRA.W.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
LA.6-8.CCSS.ELA-Literacy.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
LA.6-8.CCSS.ELA-Literacy.WHST.6-8.2d	Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.WHST.6-8.1	Write arguments focused on discipline-specific content.
LA.WHST.6-8.1.A	Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
LA.WHST.6-8.1.B	Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
LA.WHST.6-8.1.E	Provide a concluding statement or section that follows from and supports the argument presented.
LA.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.6-8.2.A	Introduce a topic and organize ideas, concepts, and information using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.

LA.WHST.6-8.2.C	Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
LA.WHST.6-8.2.D	Use precise language and domain-specific vocabulary to inform about or explain the topic.
LA.WHST.6-8.4	Produce clear and coherent writing in which the development, organization, voice, and style are appropriate to task, purpose, and audience.
LA.WHST.6-8.5	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
LA.WHST.6-8.6	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
LA.WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
LA.WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
LA.WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.
CCSS.ELA-Literacy.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
CCSS.ELA-Literacy.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
CCSS.ELA-Literacy.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CCSS.ELA-Literacy.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CCSS.ELA-Literacy.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CCSS.ELA-Literacy.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
CCSS.ELA-Literacy.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
CCSS.ELA-Literacy.RST.6-8.10	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

Differentiation

[Differentiation in science](#) can be accomplished in several ways. Once you have given a pre-test to students, you know what information has already been mastered and what they still need to work on. Next, you design activities, discussions, lectures, and so on to teach information to students. The best way is to have two or three groups of students divided by ability level.

While you are instructing one group, the other groups are working on activities to further their knowledge of the concepts. For example, while you are helping one group learn the planet names in order, another group is researching climate, size, and distance from the moon of each planet. Then the groups switch, and you instruct the second group on another objective from the space unit. The first group practices writing the order of the planets and drawing a diagram of them.

Here are some ideas for the classroom when you are using differentiation in science:

- Create a tic-tac-toe board that lists different activities at different ability levels. When students aren't involved in direct instruction with you, they can work on activities from their tic-tac-toe board. These boards have nine squares, like a tic-tac-toe board; and each square lists an activity that corresponds with the science unit. For example, one solar system activity for advanced science students might be to create a power point presentation about eclipses. For beginning students, an activity might be to make a poster for one of the planets and include important data such as size, order from the sun, whether it has moons, and so on.
- Find websites on the current science unit that students can explore on their own.
- Allow students to work in small groups to create a project throughout the entire unit. For example, one group might create a solar system model to scale. Another group might write a play about the solar system. This is an activity these groups can work on while they are not working directly with you.

Differentiation in science gets students excited to learn because it challenges them to expand their knowledge and skills, instead of teaching the whole group concepts they have already mastered.

Modifications & Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMODATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

IEP and 504 Accommodations will be utilized.

In addition to differentiated instruction, IEP's and 504 accommodations will be utilized.

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

Additional Benchmarks used in this unit:

The students will complete two summative benchmark tests administered by the teacher via Google Forms and Google Classroom. There is one benchmark test administered in the middle of the year around January, and a second one administered in May.

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

See assessments located in the unit link above.

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

See assessments located in the unit link above.

Instructional Materials

See materials located in Unit above.

Standards

SCI.MS.ESS1.A	The Universe and Its Stars
SCI.MS.ESS1.B	Earth and the Solar System
SCI.MS-ESS1	Earth's Place in the Universe
SCI.MS-ESS1-1	<p>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.</p> <p>Develop and use a model to describe phenomena.</p> <p>Patterns</p> <p>Examples of models can be physical, graphical, or conceptual.</p> <p>Developing and Using Models</p> <p>Patterns can be used to identify cause-and-effect relationships.</p> <p>Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.</p> <p>Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models.</p> <p>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.</p>