CCPS Science Unit Plan

Grade	6th	**Subject**	Science	**Unit #**	1
Unit Name	Life as an Astronomer		**Timeline**	6 weeks	
How to use the Framework	This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding of all abbreviations used with this framework.				
Unit Overview	This unit on Astronomy will focus on the student's conceptual understanding of the current scientific views of the universe and how those views have evolved. The students will understand the position of our solar system within the Milky Way Galaxy. Planets and other bodies will also be explored, like asteroids and comets within our solar system. Students will also understand the effects of the relative positions of the earth, moon, and sun, along with their positions during solar and lunar eclipses, and also how the motion of the planets and other bodies are affected by gravity and inertia. Gravity and inertia is used to highlight the integration of 6th-grade earth science GSE and 8th-grade physical science GSE. Space probes are the anchoring phenomenon and should be integrated throughout the unit. This unit is divided into two mini-units. The first mini-unit addresses the solar system and gravity. The second mini-unit includes moon phases, eclipses, and seasons.				

3Dimensional Instruction

GSE	Science and Engineering Practices	Crosscutting Concepts
S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved. **S6E1.a.** Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information. (Clarification statement: Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the formation of the universe.) **S6E1.b.** Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe. **S6E1.c.** Analyze and interpret data to compare and contrast the planets in our solar system in terms of:	• Develop and use Models • Engage in Arguments from Evidence • Asking Questions and Defining Problems • Planning and Carrying out Investigations • Analyzing and Interpreting Data • Using Mathematics and Computational Thinking • Constructing Explanations and Designing Solutions • Obtaining, Evaluating and Communicating Information	• Patterns • Scale, Proportion and Quantity • Systems and System Models

	-size relative to Earth, -surface and atmospheric features, -relative distance from the sun, and ability to support life. **S6E1.d.** Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system. **S6E1.e.** Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids. **S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, earth, and moon.** **S6E2.a.** Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon. **S6E2.b.** Construct an explanation of the cause of solar and lunar eclipses. **S6E2.c.** Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.		

NGSS Alignment	NGSS Alignment to Disciplinary Core Ideas

Weekly Lesson Tasks
Teacher Notes

Week 1	
GSE: **S6E1a**. Ask questions to determine changes in models of Earth's position in the solar system and origins of the universe as evidence that scientific theories change with the addition of new	**Focused Concept:** Many early scientists believed the Earth was the center of our Solar System, with other planets and the sun orbiting Earth. With Earth at the center, this representation is called the geocentric model. Astronomers continued to study and observe the solar system using technology, such as telescopes, to learn more about the solar system. Early Scientists (such as Galileo or Copernicus) made several observations. These observations eventually led scientists to accept the heliocentric model, in which the sun is in the center of the Solar System, and all the planets orbit the Sun.

information. (*Clarification statement*: Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the universe's formation.) **S6E1b**. Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe	The Big Bang Theory explains that the universe was formed through a great explosion from an initial high density and temperature area. This theory is largely thought to be an explosion of space rather than an explosion of other things in space, which leads to the constant expansion of the Universe. The origin of the Solar System, as indicated by evidence related to the Big Bang Theory, is thought to be between 10 and 20 billion years ago. This theory proves that the universe began as a hot, dense state and continues to expand over time. The universe is very large and contains billions of galaxies. The Milky Way galaxy is just one of these galaxies in the universe. The Milky Way lies near an area of the universe known as Orion's Arm or Orion's Spur. The Milky Way galaxy is a spiral galaxy that contains 200-400 billion stars that all orbit a supermassive black hole in the very center of the galaxy. A spiral galaxy like the Milky Way appears like a flat spiral with arms that extend from the edges and are largely made of spinning gas and dust. Big Bang Theory Geocentric Heliocentric Solar System Universe Elliptical Galaxy Galaxy Irregular Galaxy Milky Way Spiral Galaxy
SEP: **(A) Asking Questions** **(B) Developing and Using Models**	**CCC:** **(A) Patterns; Cause and Effect; Systems and Systems Models; Energy and Matter** **(B) Patterns; Systems and Systems Models; Stability and Change**
Phenomenon: As students explore this phenomenon, they learn the science concepts behind the lesson. Gravity is the universal force that affects all objects with mass. The force of gravity is determined by the masses of objects and the distance between them. Gravity is needed to form galaxies, solar systems, and planets. It also governs the motions of objects in the universe. **Big Bang and Models of the Universe** **How Big is Space?** NASA's exploration beyond the solar system (interactive of light years and the size of the Milky Way) **Solar System:** Space probes in the solar system (choose one to focus on): • New Horizon's fly by Pluto (July 2015, 20 minutes) • Curious Life of Mars Rovers (Spirit, Opportunity, and Curiosity): (25 minutes) • Crashing into Saturn Discussion Question: How do objects in the solar system compare? STW Protocol	**DQ:** • How have theories of the formation and structure of the universe changed? • What would space be like without gravity? • What role does gravity play in the formation and motion of components within galaxies and our solar system? • How is our solar system positioned in the Milky Way Galaxy and the universe? ***The teacher will access Module: Exploring the Universe—Lesson 1: Gravity and the Universe for online instruction and assign activities for the instructional week.***

Learning Target:	Day 1	Day 2	Day 3	Day 4	Day 5
The students will be able to (SWBAT)	**SWBAT** -Explain the Big Bang Theory and its relationship to universal expansion.	**SWBAT** -Explain the Big Bang Theory and its relationship to universal expansion.	**SWBAT** -Explain the Big Bang Theory and its relationship to universal expansion.	**SWBAT** develop a model to demonstrate our position within the Milky	**SWBAT** -Explain the Big Bang Theory and its relationship to universal expansion.

	-Analyze the differences between the heliocentric and geocentric solar system models and develop and use a geocentric model.	-Analyze the differences between the heliocentric and geocentric solar system models and develop and use a geocentric model.	-Analyze the differences between the heliocentric and geocentric solar system models and develop and use a geocentric model.	Way Galaxy and the Universe.	-Analyze the differences between the heliocentric and geocentric solar system models and develop and use a geocentric model. -Develop a model to demonstrate our position within the Milky Way Galaxy and the Universe.
Opening **The Teacher Will (TTW)** **Student will (SW)** **See-Think-Wonder Protocol (STW)**	Phenomenon: Theories of the Universe **DQ**: **How have theories of the formation and structure of the universe changed?** TTW show students images of the geocentric and heliocentric models - side-by-side images without labels. Students will complete a STW Protocol. Use the STW protocol to guide student thinking. Teachers should provide students opportunities to provide observations and develop questions. The teacher should record students' questions. After students share their initial ideas and questions, guide them toward these questions **Questions for Discussion:** How do we know what's at the center of our solar system? Our galaxy? Our Universe? How do we research	TTW open the lesson, by discussing the importance of understanding different models of the solar system. Explain that there are various historical and contemporary models, each with its own features and perspectives. Emphasize the significance of research and communication skills in exploring and sharing this knowledge. TTW start the lesson by asking students to review what they have learned from the previous lesson: **Geocentric and Heliocentric models** **Teacher Choice Activity:** Quick Draw- Allow students to draw a quick sketch of the heliocentric and geocentric models. Students should discuss the similarities and differences between the Geocentric and Heliocentric models	Phenomenon: Big Bang and Models of the Universe How Big is Space? NASA's exploration beyond the solar system (interactive of light years and the size of the Milky Way) **Inquiry Lab:** SW model how the Big Bang was not an explosion, but an expansion of space. Student Handout *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical thinking and deeper comprehension.*	**(* Located in textbook)** **Engage Encounter the Phenomenon: Gravity and the Universe** Phenomenon: What would space be like without gravity? SW view the Forming Galaxies video to see the phenomenon in action. SW create a list of all the components of the universe before and discuss what would happen to components if gravity did not exist.	TTW recap the previous day's lesson on Universal Expansion **Topics:** Geocentric/Heliocentric Big Bang and Models of the Universe TTW engage students in a brief discussion about what they remember about the geocentric, heliocentric models, and Big Bang Theory Models of the Universe.

	space? How far have we gone? What kind of technology does space research require?				
Guided Practice/ Transition	TTW displays Theories of the Universe Powerpoint each student should receive a copy of the guided notes handout that corresponds to the PowerPoint presentation. TTW explain to students that they will be filling in their guided notes as you present the information on the origin of the universe theories. SW complete guided notes. Student Handout: Theories of the Universe Notes	TTW begin by discussing the importance of understanding different models of the solar system. Explain that there are various historical and contemporary models, each with its own features and perspectives. Emphasize the significance of research and communication skills in exploring and sharing this knowledge. **Research - small group** Divide students into small groups or pairs. SW research various models of the solar system and communicate their findings to the class. Guiding Question: *How have theories of the formation and structure of the universe changed?* What is your philosopher's claim? What is your philosopher's evidence? What is your philosopher's reasoning? (connects the evidence to your philosopher's claim)	TTW introduce and assign **Pivot Interactive Activities: The Expanding Universe** TTW and SW complete Part 3: A 2-D Model: Stretchy Membrane Universe Model (Whole Group)	TTW display How is our solar system positioned in the Milky Way Galaxy and the Universe? PPT Guide and allow students to complete guided notes - graphic organizer. Student Handout	Review Game: **Competitive Game: "Shoot for the Stars** Divide the class into small teams. Students will work in teams to answer review questions about the Geocentric and Heliocentric models of the universe. Correct answers will give them a chance to shoot balls (or paper wads) into a trash can for points. Game Rules and Questions

Independent Practice	SW work in groups of 3-4 to complete the CER Narrative using anchor chart paper. **CER Narrative** TTW introduce Claim-Evidence-Reasoning and CER Narrative. In this activity, the students will work collaboratively to create a claim and provide evidence based on the guiding question. Guiding Question: How have theories of the formation and structure of the universe changed? SW Complete CER Narrative Activity. TTW review the Exploring the Phenomenon	**Research - small group** Assign each group a specific model of the solar system to research (e.g., geocentric, heliocentric, Ptolemaic, Copernican, modern). TTW instruct students to take notes on key points, including the main features of their assigned model, its historical context, and any controversies or debates surrounding it. SW use chart paper to organize and visually display their findings from their research on their assigned philosopher. Each group will create a comprehensive poster that includes key details, quotes, and images related to the philosopher's life and beliefs. One member from each group will then present their research to the class. During these presentations, the rest of the students will actively listen and use a graphic organizers to take structured notes on each philosopher, capturing important information about their philosophies and contributions. **Group 1** - Geocentric Model (Aristotle) **Group 2** - Geocentric Model (Ptolemy) **Group 3**- Heliocentric	TTW discuss the Big Bang theory and how it describes the origins of the universe. SW read and annotate the following text: Article-Big Bang Theory Reading Comprehension In groups, SW provide each group with a small portion of the text. Have the students in the group read independently SW read individually, to discuss information read in their groups. TTW encourage students to take notes or draw pictures in the margin. Students should highlight, underline, circle, and or box key phrases, vocabulary, or important concepts. When students have completed their discussion, TTW allow the groups to mix up and share their knowledge with other groups. Monitor student performance by circulating the classroom and providing feedback as they work.	SW complete the Our Place in the Universe worksheet. Student handout *The teacher should be actively circulating the classroom, checking in on students' screens to ensure they are engaging with the simulation as intended and following the instructions accurately. The teacher should also be asking targeted questions and providing support to help students understand the concepts being explored, ensuring they stay focused and on-task.* Allow students to quietly discuss the material with a partner if they're stuck, promoting collaborative learning.	SW create a poster or brochure advertising the Milky Way Galaxy as a vacation destination. Be sure to include the following info (at a minimum) Rubric Handout • Galaxy Name • Classification (type) • # stars • # LY across • #km across • Approximate age of MWG • Our SS location in MWG (directions to our SS) • ANY info you think would get someone to visit our galaxy - be creative

		Model (Copernicus) **Group 4**- Heliocentric Model (Galileo) Sources for Geo & Helio Models Research: • Early Astronomers • Differences in GCM and HCM • Changing Ideas about the SS • Geocentric and Heliocentric Models Materials: chart paper, printed articles, highlighters, markers, notebooks Provide feedback and evaluate students based on the quality of their research, the clarity and effectiveness of their presentations, and their participation in class discussions.	SW complete Student Handout-The Big Bang Reading Comprehension Questions Student Handout *The teacher should be actively circulating the classroom, checking in on students' screens to ensure they are engaging with the simulation as intended and following the instructions accurately. The teacher should also be asking targeted questions and providing support to help students understand the concepts being explored, ensuring they stay focused and on-task.* Allow students to quietly discuss the material with a partner if they're stuck, promoting collaborative learning.		
Assessment Summary	TOD: Complete CER Narrative Activity. TTW review the Exploring the Phenomenon	TOD: Heliocentric and Geocentric Model: What is the main difference between the geocentric model and the heliocentric model of the solar system? Provide feedback on their ability to analyze and communicate scientific information accurately and persuasively.	TOD: Exploring the Big Bang Theory Questions: What does the Big Bang theory say about the origin of the Universe? What is one piece of evidence that supports the Big Bang Theory?	TOD: Exploring the Big Bang Theory Reflection Question: Why do scientific theories, such as the Big Bang Theory, evolve over time?	TOD:Reflection: Summarize the key points of the lesson, emphasizing Geocentric/Heliocentric Models, the Big Bang, and Models of the Universe. How do the changes from the geocentric to the heliocentric model and the development of the Big Bang theory show that scientific knowledge is always evolving?
Small Group Tasks					

(TBA)					

Week 2	
GSE: **S6E1c**. Analyze and interpret data to compare and contrast the planets in our solar system in terms of: size relative to Earth, surface and atmospheric features, relative distance from the sun, and ability to support life.	**Focused Concept:** The Solar System is made up of the sun, planets, and other objects that are linked to the sun by gravity. The different parts of the solar system have different characteristics that help classify them. When looking at the planets, the characteristics usually discussed are sized relative to Earth, surface, and atmosphere; some have flat rings of rocks, and others have ice particles floating around. The planets can be divided into two groups: the inner planets and the other planets. The separation occurs between Mars and Jupiter, where the Main Asteroid Belt can be seen in the Solar System. Astronomical unit Atmosphere Elliptical orbit Gaseous Planets Planet Satellite Terrestrial Planets ***The teacher will access Module: Explore the Universe - Lesson 2: The Solar System** for online **instruction and assign activities used for the instructional week.***
SEP: Analyzing and interpreting data	**CCC:** Patterns; Scale, Proportion, and Quantity; Systems and System Models; Energy and Matter
Phenomenon: How do objects in the solar system compare?	**DQ:** What are the distinguishing properties of objects in our solar system? How can you model the solar system? What are the other objects in the solar system?

Learning Target:	**Day 6**	**Day 7**	**Day 8**	**Day 9**	**Day 10**
The students will be able to (SWBAT)	**SWBAT** analyze data to compare and contrast the planets in terms of size, surface, and atmospheric. features, distance from the sun, and their ability to support life.	**SWBAT** analyze data to compare and contrast the planets in terms of size, surface, and atmospheric. features, distance from the sun, and their ability to support life.	**SWBAT** -Analyze data to compare and contrast the planets in terms of size, surface, and atmospheric. features, distance from the sun, and their ability to support life. -Analyze and interpret data to evaluate a planet's ability to support life.	**SWBAT** -Analyze data to compare and contrast the planets in terms of size, surface, and atmospheric. features, distance from the sun, and their ability to support life. -Interpret evidence to identify the main characteristics that distinguish each of the inner and outer planets.	**SWBAT** interpret evidence to identify the main characteristics that distinguish each of the inner and outer planets.

Opening	**(* Located in textbook)** **Science Probe** **Objects in Space** TTW use this science probe to assess students' prior knowledge of the lesson content and to identify possible preconceptions.	TTW open the lesson asking the following questions: What is one difference between the Sun and the objects that orbit it? How do scientists learn about objects in the solar system? SW jot down their responses and actively participate in a class discussion. As students share their responses, the teacher will reference the phenomenon being studied, drawing connections and providing additional insights to enrich the discussion.	TTW remind students that scientists use models to study objects that are too large, too small, or too dangerous to study directly. DQ: How can you model the solar system? Ask: What are some limitations of using a model to study the system? SW jot down their responses and actively participate in a class discussion. As students share their responses, the teacher will reference the phenomenon being studied, drawing connections and providing additional insights to enrich the discussion.	TTW open the lesson by discussing that scientists are still discovering objects. DQ: What are the other objects in the solar system? Ask: Why do scientists sometimes reclassify objects in the solar system? SW jot down their responses and actively participate in a class discussion. As students share their responses, the teacher will reference the phenomenon being studied, drawing connections and providing additional insights to enrich the discussion.	TTW introduce a Task: Solar System CER using the Slides Copy of 3-D Task: S…
Guided Practice/Transition	**(* Located in textbook)** **Engage: Encounter the Phenomenon** <u>Phenomenon: How do objects in the solar system compare?</u> DQ: What are the distinguishing properties of objects in the solar system? Option: GO ONLINE SW view the animation in Our Neighborhood to see the phenomenon in action. SW record what will create a list of components in the universe before and discuss	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Investigation: Compare the View** SW analyze to observe how technology is used to study space TTW ask students if they have ever used a telescope to view objects in the night sky. Allow students to share their experiences with the class.	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Read About**: 1. How do scientists analyze data about the solar system? SW add to Foldable notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.*	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Investigation: Moons of the Outer Planets** SW compare and contrast the characteristics of the largest moons of the outer planets. *The teacher should circulate to monitor their progress and ask probing questions to help them think critically about their findings. Additionally, the teacher should provide guidance on interpreting data accurately and*	SW complete the **3D task**- choose two factors from the data on the next slide to compare, graph, and analyze. For example, you may choose to compare planet diameter and density. SW complete a **CER** to show your comparison.

	what would happen to components if gravity did not exist. TTW: Introduce the CER SW: Explain the Phenomenon **Go Online: CER: Explain the Phenomenon** SW complete a Claim: How objects in the solar system can be analyzed and interpreted	*The teacher should circulate to monitor their progress and ask probing questions to help them think critically about their findings. Additionally, the teacher should provide guidance on interpreting data accurately and drawing evidence-based conclusions.*	**Lab:** **Model the Inner Planets** SW use ratios to develop scale models of the inner planets. *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical thinking and deeper comprehension*	*drawing evidence-based conclusions.*	

Independent Practice	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Read About:** 1. What objects make up the solar system? 2. How do astronomers observe the solar system? TTW assign a *Foldable* activity to take notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.*	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Investigation: Graphing Characteristics** TTW propose the following question: What methods you think scientists use to analyze planetary data *The teacher should circulate to monitor their progress and ask probing questions to help them think critically about their findings. Additionally, the teacher should provide guidance on interpreting data accurately and drawing evidence-based conclusions.*	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Lab: Scale Down** SW examine the positions of the planets of the solar system relative to each other and to the Sun. *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical thinking and deeper comprehension.*	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Read About**: 1. What are the other objects of the solar system? SW add to *Foldable* notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.* SW compare and contrast objects in the solar system.	SW complete Summary and Exit Ticket/Reflection on the Slides Copy of 3-D Task: S… Slide 8
Assessment/Summary	**(* Located in textbook)** **Explore and Explain** SW complete Collect Evidence (A) How has space exploration helped the advancement of technology? SW record evidence in CER chart (refer to TE). Review Explain the Phenomenon	**(* Located in textbook)** **Explore and Explain** SW complete Collect Evidence (B) How do the planets in the solar system compare to each other? SW records evidence in CER chart SW looks for trends and data to record from the collected evidence. TTW evaluates student responses for accuracy.	**(* Located in textbook)** **Explore and Explain** 3D Thinking: How can you model the solar system? TTW evaluate student answers to discuss whether the scales are workable and/or Investigate other characteristics of the inner planets to complete Extension	**(* Located in textbook)** **Evaluate** Lesson Check: The Solar System	**Common Assessment 1** **At this checkpoint, it is suggested that the teacher administers a Common Formative Assessment to evaluate student understanding.**
Small Group Tasks (TBA)					

Week 3					
GSE: **S6E1d.** Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.		**Focused Concept:** The Solar System consists of the sun, planets, and various other objects that are held in orbit around the sun because of the gravitational pull and inertia effect on those objects. Gravity Inertia Force Mass Newton's First Law of Motion ***The teacher will access Module: Explore the Universe - Lesson 1: Gravity and the Universe** for online **instruction and assign activities used for the instructional week.***			
SEP: Developing and Using Models		**CCC: Energy and Matter; Cause and Effect; Stability and Change**			
Phenomenon: What would space be like without gravity?			**DQ:** What is gravity? What role does gravity play in the formation and motion of components within galaxies and our solar system?		
Learning Target:	**Day 11**	**Day 12**	**Day 13**	**Day 14**	**Day 15**
The students will be able to (SWBAT)	**SWBAT** develop a model to demonstrate how gravity and inertia affect the motion of objects in the solar system.	**SWBAT** develop a model to demonstrate how gravity and inertia affect the motion of objects in the solar system.	**SWBAT** -Describe the composition and relative position of objects found in the solar system. -Develop a model to demonstrate how gravity and inertia affect the motion of objects in the solar system.	**SWBAT** develop a model to demonstrate how gravity and inertia affect the motion of objects in the solar system.	**SWBAT** obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.

Opening	**(* Located in textbook)** **Science Probe:** **Gravity in Space** TTW use this science probe to assess students' prior knowledge of the lesson content and to identify possible preconceptions. TTW open the lesson discussing how the force of gravity depends on mass and distance. DQ: What is gravity? Ask: What forces keep you from floating off into space?	TTW open the lesson by asking students to review what they have learned from the previous lesson: the role of gravity. SW complete the claim section of the graphic organizer - answering the following question: How would you build a stable solar system? Student Handout TTW facilitate a class discussion asking students to share how they would create a stable solar system.	TTW review the concept of the role of gravity in the formation of the Universe. What is a good example of how gravity works? Provide an example of how gravity can be an enemy to you. (Refer to PHET PPT) SW complete Pre-Lab (Refer to PHET PPT Slide 1) Presentation Link Student Handout Discussion Questions: What force caused the planets to take shape? The solar system formed from what type of cloud? Why do the outer planets continue to revolve around the Sun?	TTW review the previous lesson and draw a visual on the board showing the difference between a circle and ellipse. How does an elliptical shape differ from a circular shape?	TTW review concepts previously taught. Topic: Gravity Engage students in a brief discussion about what they remember about gravity by starting with a few open-ended questions to stimulate their thinking and recall. Begin by asking, "Who can tell me what gravity is?" Encourage students to share their thoughts and experiences with gravity, such as how it affects objects falling to the ground or how it keeps us grounded on Earth. Follow up with questions like, "Can you think of any examples where you've noticed gravity in action?" and "Why do you think gravity is important in our daily lives?" Listen attentively to their responses, providing positive reinforcement and clarifying any misconceptions.
Guided Practice/Transition	**(* Located in textbook)** **Engage: Encounter the Phenomenon** Phenomenon: What would space be like without gravity? DQ: What roles does gravity play in the formation and motion of	TTW introduce the simulation - Build Your Own Solar System. *Demonstrate your ability to add as many planets as possible to create your own solar system. To form a "planet mass," hold down on the screen and release when the mass reaches your desired size. You must quickly build each mass to successfully create the solar system.*	TTW introduce the PHET investigation by having students first watch a video of the activity. After viewing the video, students will then complete the investigation themselves. **PHET investigation - *Gravity and Orbits:***	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Read About:** 1. How does gravity affect objects that orbit the sun? SW complete a *Foldable* to	TTW introduce the Lab reviewing the objective of the lab and lab safety. SW conduct *Egg Lander* Reflection and Gravity Lab Questionnaire. Lab Activity Handout

	components within galaxies and our solar system? SW complete Encounter the Phenomenon SW watch the video Forming Galaxies SW record their thoughts on the components in the video. **Explore and Explain** Go Online Interactive Presentation **Read About:** 1. What is gravity? 2. What is gravity's role in the formation of stars? TTW assign a *Foldable* activity to take notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.* **Teacher Choice Activity:** *Reading Essentials: Gravity and the Universe* *Interactive reading experience to improve student comprehension of science content. It makes lesson content more accessible to struggling students and supports goals for differentiated instruction. Students can highlight text and take notes right in the book!*	Interactive Presentation Resource Direct Link SW explore the simulation to build a stable solar system. Allow students to complete the evidence (draw a sketch of the model created) and reason sections of the handout. TTW explain the role of gravity as it relates to the stability of our solar system.	***Gravitational Forces and The Great Gravity Escape*** (Refer to PPT slide 5)	take notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.* **Lab: Elliptical Orbits** SW learn the relationship between the distance from one focal point to the shape of the ellipse. *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical thinking and deeper comprehension.*	

Independent Practice	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Investigation: What Goes Up Must Come Down?** TTW use images to help students visualize how the force of gravity is affected by mass and distance. SW explore the definition of gravity and learn about the factors that affect the force of gravity. *The teacher should circulate to monitor their progress and ask probing questions to help them think critically about their findings. Additionally, the teacher should provide guidance on interpreting data accurately and drawing evidence-based conclusions.*	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Read About**: 1. What is gravity's role in the formation of stars? 2. What is the role of gravity in the formation of the solar system? SW complete a *Foldable* to take notes**.** *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.* **Lab: Changing Shapes** *(Refer to TE for activity guidance)* SW Develop and use a model to investigate the role of gravity when forming the solar system. *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical*	SW complete **PHET: Gravity and Orbits: Gravitational Forces** **Investigation Lab: How do the masses of the Earth, Moon, and Sun affect their orbital paths?** Direct Link *The teacher should circulate to monitor their progress and ask probing questions to help them think critically about their findings. Additionally, the teacher should provide guidance on interpreting data accurately and drawing evidence-based conclusions.*	SW investigate which of their ellipses represent the orbits of the inner and outer planet to complete **Extension** **Teacher Choice Activity:** Gravity Pitch Gizmo Student Handout Teacher Guide	TTW and SW: • Complete a 5-question assessment to gauge comprehension and retention of the material. Week 3 Quuick Asse…

		thinking and deeper comprehension.			
Assessment/Summary	**(* Located in textbook) Explore and Explain** 3D Thinking: What is gravity? TTW evaluate student argument for accuracy. SW Review concepts	SW complete the ***Analyze and Conclude section of the lab*** to explain how gravity affected actions completed during the lab.	**(* Located in textbook) Explore and Explain** Complete conclusion section on lab. TTW review and feedback: After collecting student responses, review them to identify common misconceptions or areas of confusion.	**(* Located in textbook) Explore and Explain** SW complete CER: Collect Evidence Question: How did the solar system form? SW return back to the CER graphic organizer and record their evidence. TTW evaluate student responses for accuracy.	**(* Located in textbook) Explore and Explain** 3D Thinking: What role of gravity in the formation of the solar system? TTW evaluate student argument for accuracy. SW Review concepts
Small Group Tasks (TBA)					

Week 4					
GSE: **S6E1e**. Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids.		**Focused Concept:** Comets, asteroids, and meteoroids are a part of our Solar System. These are all smaller than our planets and orbit the sun. Most of these are fragments from the formation of the Solar System. Asteroid Belt Kuiper Belt Meteor Meteoroid Meteorite Comet Coma Tail Nucleus Oort Cloud			
SEP: Asking Question		**CCC: Systems and Systems Models; Structure and Function; Patterns**			
Phenomenon: ***How do Objects in the Solar System Compare?*** ***Women Hit by a Meteorite*** Video **Description of video:** Ann Hodges has the distinction of being the only human to have been hit by a meteorite. While Mrs. Hodges was napping on the couch the meteorite impacted her house, bounced off a table, and hit her in the hip. She was able to walk away from the incident. Scientists can learn about the composition of the early solar system and the formation of the Earth by studying these primordial objects orbiting in space.			**DQ:** **What are the distinguishing properties of objects in our solar system?**		
Learning Target:	**Day 16**	**Day 17**	**Day 18**	**Day 19**	**Day 20**

The students will be able to (SWBAT)	**SWBAT** describe the defining physical features of comets, asteroids, and meteoroids, and explain how they differ.	**SWBAT** identify the primary components of comets and contrast these with the compositions meteoroids, meteors, or meteorites.	**SWBAT** locate where comets are usually found in the solar system and compare this to the typical locations of asteroids and meteoroids.	**SWBAT** explain the different orbital patterns of comets, asteroids, and meteoroids and how these orbits impact their behavior in the solar system.	**SWBAT** explain the different orbital patterns of comets, asteroids, and meteoroids and how these orbits impact their behavior in the solar system.
Opening	Phenomenon: ***Women Hit by a Meteorite*** Video TTW show the video and ask students Discussion Questions. After students share their initial ideas and questions, guide them toward these discussion questions. ○ How could objects from outer space enter the Earth's atmosphere? ○ How could small bodies from outer space hold the key to understanding the origin of the universe and the solar system?	TTW open the lesson by asking students to review what they have learned from the previous lesson: meteoroids, meteors, or meteorites. **Feature Match-Up** SW create a chart with three columns labeled "Comet," "Asteroid," and "Meteoroid." Give students 2 minutes to write down as many defining features as they can think of for each category. Encourage them to share any prior knowledge they have. Explain that despite their similar names, meteoroids, meteors, and meteorites have distinct characteristics and stages in their journey through space.	TTW open the lesson by showing images of comets, asteroids, and meteoroids on the screen. Facilitate a class discussion asking students what they already know about each celestial body. NASA Gallery Link TTW ask students to brainstorm questions about the characteristics, composition, and location of comets, asteroids, and meteoroids.	Phenomenon: As we observe the night sky, we notice that celestial bodies like stars, planets, and moons appear to move in specific patterns. **Night Sky Observation** Display a video clip of the night sky showing moving celestial bodies (e.g., time-lapse of stars). After watching, ask students to share what they noticed about the movement. Night Sky Time La…	TTW review concepts previously taught and refer back to the Phenomenon. Small Objects in the Solar System Provide students with a blank piece of paper and colored pencils. Ask them to quickly sketch and label the orbits of a comet, asteroid, and meteoroid. They should indicate which is elliptical, circular, or irregular.
Guided Practice/Transition	TTW display the interactive slides PPT Link SW take interactive notes from the slides. Student Handout	Research Activity - Graphical Representation Divide the class into small groups. Provide each group with a piece of graph paper or drawing paper and colored pencils/markers.	TTW divide the class into small groups. TTW provide each group with research materials (books, websites, etc.) about comets, asteroids, and meteoroids.	Introduction to Models: Begin by introducing different types of models used to represent the solar system, such as scale models and digital simulations. Discuss the advantages and limitations of each type.	**(* Located in textbook)** **Evaluate** **Lesson Review: The Solar System** SW *Summarize It!* 1. Construct a graphic organizer that compares and contrasts objects

	TTW instruct students to work together to gather information and take notes on the characteristics, composition, and location of each celestial body.	Instruct students to create three separate graphical representations (charts, diagrams, or drawings) comparing and contrasting meteoroids, meteors, and meteorites based on the following criteria: • Size (diameter) • Location (where they are found) • Composition (materials they are made of) TTW encourage students to use different colors, symbols, or labels to differentiate between the three space objects. TTW facilitate around the classroom to assist students and answer any questions they may have.	Encourage students to discuss and compare their findings within their groups. Encourage students to label the different parts of each celestial body based on their research findings. Allow students to share their models with the class and explain their design choices.	*Location in Space*: Teach students about the relative positions of the Sun, planets, and other objects in the solar system. Use visual aids like diagrams or posters to illustrate the layout of the solar system. *Planets*: Provide an overview of the eight planets in our solar system, including their names, sizes, compositions, and unique features. *Small Objects*: Explore the diversity of small objects in the solar system, such as asteroids, comets, and dwarf planets. Discuss their characteristics, orbits, and roles in the solar system. Encourage students to take notes and ask questions.	in the solar system **Lesson Check: The Solar System** Additional Resources: **LearnSmart: Exploring the Universe**

Independent Practice	**(* Located in textbook)** **Explore and Explain** SW Go Online Interactive Presentation **Read About:** 1. What objects make up the solar system? TTW assign a Foldable activity to take notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.* (Optional) Study Tool: Reading Essentials: The Solar System	SW present their group's findings to the class. TTW: As each group presents, encourage other students in other groups to prepare two question to ask each group at the end of their presentation. TTW facilitate a class discussion highlighting the similarities and differences between meteoroids, meteors, and meteorites based on the presented representations.	**Vocabulary Strategy: Four Square** TTW provide students with the graphic organizer (editable) or pdf handout, explaining its four sections: word, meaning, picture, and sentence. Allow students to work in collaborative groups. Actively monitor and facilitate small group discussions and review various artifacts (pictures, images, primary sources, charts) to build knowledge of the term. Have students collaborate to complete the four square strategy for the other vocabulary terms. Monitor student progress, sharing new ideas for class discussion, and help students distinguish essential from non-essential characteristics.	Model Building: Divide students into small groups and provide them with materials to create their scale models of the solar system. Encourage creativity and accuracy in representing the sizes and distances of celestial bodies. Research Project: Assign each student or group a specific celestial body or small object in the solar system to research. Have them create a presentation or poster highlighting key facts and findings about their assigned object. Observational Activity: Encourage students to observe the night sky on a clear evening and identify as many celestial bodies as they can using star charts or astronomy apps.	**Common Assessment 2** **At this checkpoint, it is suggested that the teacher administers a Common Formative Assessment to evaluate student understanding.** SW review concepts from the previous lessons.

Assessment/Summary	TOD: **Writing Prompt** Why do you think asteroids and comets have different compositions?	TOD: **Reflection** Summarize the key points of the lesson, emphasizing the similarities in composition but differences in size and location among meteoroids, meteors, and meteorites. Describe how the size of a meteoroid compares to that of a meteor and a meteorite. Provide specific examples to illustrate the differences.	TOD: How do scientists learn about objects in the solar system? Encourage students to continue exploring space science and astronomy in their own time. Assign a small homework task, such as researching a famous meteorite impact event or finding out how scientists study meteoroids.	TOD: Summative Assessment: Administer a written assessment. Considering the gravitational forces of the Sun and other planets, how might the orbital paths of comets, asteroids, and meteoroids change over time, and what could this mean for the future of our solar system? TTW evaluates students' understanding through their participation in group discussions, completion of of the project.	TOD: SW answer reflection question: 1. What did you think about the assessment? 2. How well did you know the material? **3.** What activities and tasks helped you for the test?
Small Group Tasks (TBA)					

Week 5	
GSE: **S6E2a**. Develop and use a model to determine the phases of the moon by showing the relative positions of the sun, earth, and moon. **S6E2b.** Construct an explanation of the cause of solar and lunar eclipses.	**Focus Concepts:** The phases of the moon last approximately 28 days– this is known as the lunar month. This is the time needed to complete one cycle of the moon phases from the new moon to the next new moon. During each lunar cycle, the moon revolves around Earth and goes through all of the phases. The moon has no light source of its own and is only able to reflect the light from the sun based on the position of the sun, Earth, and moon. This means the phases the moon goes through are based on where the sunlight can reach, be reflected off the surface of the moon, and be seen by Earth. At any given time, sunlight illuminates half the moon, but it is not always the area that can be viewed from Earth's surface. The other half of the moon that does not have sunlight reaching it will remain in darkness. The Earth, sun and moon have predictable orbits. When these orbits cause one object to pass between two other objects, shadows are cast, These shadows are seen as eclipses on Earth. Two types of eclipses are seen on Earth: solar and lunar. Each of these can be a total eclipse, where you see the entirety of the sun or moon blocked, or partial, with only part of the sun or moon blocked. **Unit Vocabulary** First Quarter Full Moon New Moon Revolution Rotation Waning crescent ‘

	Waning gibbous Waxing crescent Waxing gibbous Orbit Partial Eclipses Penumbra Revolution Total Eclipses Umbra Axis Lunar Eclipse Solar Eclipse ***The teacher will access Module: The Sun-Earth-Moon System - Lesson 2: Lunar Phases for online instruction and assign activities used for the instructional week.***
SEP: **(A) Developing and using models** **(B) Constructing explanations**	**CCC:** **(A) Patterns; Systems and System Model** **(B) Patterns; Cause and Effect; Systems and System Models**
Anchoring Phenomenon: Why do we see the moon during the day? **Phenomenon: Why isn't the Moon Always Full?** ***Secondary Phenomena:*** (1) ***Solar Eclipse*** 2017 Solar Eclipse Animated By NASA Show this Solar Eclipse video animation and ask students to make a model of why they think this is happening. Use the See-Think-Wonder protocol to guide student thinking. Ask them what they remember about the 2017 solar eclipse in the U.S. **(2) What is causing these "bites" out of the Sun?**	**DQ:** What Causes the Cyclic Pattern of Lunar Phases? Why Does the Appearance of the Moon Change Over Time in a Predictable Pattern? Why Isn't There an Eclipse Every Month?

Learning Target:	**Day 21**	**Day 22**	**Day 23**	**Day 24**	**Day 25**
The students will be able to (SWBAT)	**SWBAT** use a model to observe different phases of the Moon.	**SWBAT** use a model to observe different phases of the Moon.	**SWBAT** use a model to observe different phases of the Moon.	**SWBAT** construct an explanation of the cause of solar and lunar eclipses.	**SWBAT** construct an explanation of the cause of solar and lunar eclipses.
Opening	**(* Located in textbook)** **Science Probe: Phases of the Moon** TTW use this science probe to assess students' prior knowledge of the lesson content and to identify possible preconceptions.	TTW engage students in the Phenomenon: Pictures of the Moon – various shapes, and sizes, during the day and night, etc. NASA Moon Gallery Link Ask students to jot down what they notice, and what they wonder. How can they explain the differences in shapes and sizes? Start with an initial	TTW have students examine and contrast the waxing and waning phases shown in the illustration on How does the Moon appear to change shape as it waxes? Identify the phases in sequences Remind students to revisit the *Explain the Phenomenon graphic organizer* and record their observations.	TTW: Ask the students to view the photos of the moon SW discuss why the appearance of the moon changes in a predictable pattern. TTW display the Moon Phases Gizmo Warm Up Questions TTW assesses students' prior knowledge before introducing students to the Gizmo activity	**Module: The Sun-Earth-Moon System - Lesson 3: Eclipses** **(* Located in textbook)** **Teacher Choice Activity:** **(1) Science Probe: Eclipse** TTW use this science probe to assess students' prior knowledge of the lesson content and to identify possible preconceptions. *Use the Draw Your*

		model of what they think is happening.		Prior Knowledge Questions (Do these BEFORE using the Gizmo.) Student Handout Teacher Guide	*Thinking Strategy.* **(2) Show the 2024 Eclipse** Phenomenon: 2017 Solar Eclipse Animated By NASA Show this Solar Eclipse video animation and ask students to make a model of why they think this is happening. Use the See-Think-Wonder protocol to guide student thinking. Ask them what they remember about the 2017 solar eclipse in the U.S. After students share their initial ideas and questions, guide them toward these questions. Why Isn't There an Eclipse Every Month? How can the solar eclipse be used to explain other phenomena (the Earth is round, the Earth orbits the sun, etc.)? How can the moon cover the Sun during the solar eclipse? When does a solar eclipse occur?

Guided Practice/ Transition	**(* Located in textbook)** **Engage: Encounter the Phenomenon** Phenomenon: Why isn't the Moon always full? DQ: What causes the cyclic pattern of lunar phases? **Explore and Explain** **Lab: Moon Phases** SW model the phases of the Moon and describe their causes. *Teacher can show a lab video of Moon Phases.* *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical thinking and deeper comprehension.*	DQ: Why do we see the moon during the daytime? Use the STW Protocol (See-Think-Wonder) to guide student thinking as you go through the pictures of the moon. After students share their initial ideas and questions, guide them toward these questions. Why does the appearance of the Moon appear to change in a predictable pattern? Why do we only observe the near side of the moon? How does the orbital period of the moon affect what we see? How can the Earth and the Moon's motion affect what we observe in the sky? **(* Located in textbook)** **Explore and Explain** **Investigation: The Motion of the Moon** SW model the rotation of the Moon as it revolves around Earth	TTW guide the students for the Reading Activity: GO ONLINE: **Science and Society: Return to the Moon** Before You Read: SW: Think/Pair/Share Preview the Text During the Reading: Shared Reading (Detailed instructions are in TE)	TTW demonstrate how to navigate the *Moon Phases Gizmo* Warm-up. SW discuss their responses as a class, ensuring that they review and understand the key concepts that will be explored throughout the Gizmo activity. TTW and SW work together on **Part A** of the Moon Phases Gizmo. **Activity A** focuses on why we see Moon phases.	**(* Located in textbook)** **Engage: Encounter the Phenomenon: Eclipses** Phenomenon: What is causing these "bites" out of the Sun? SW watch the video Eclipses to see this phenomenon in action and complete activity.
Independent Practice	**(* Located in textbook)** **Explore and Explain** SW complete Go Online Interactive Presentation:	**(* Located in textbook)** **Explore and Explain** SW complete Go Online Interactive Presentation:	**(* Located in textbook)** **Evaluate** SW complete Go Online Interactive Presentation:	SW: Work on **part B** and if time permits Complete **Extension Activity B** students learn	**(* Located in textbook)** **Explore and Explain** SW complete Go Online Interactive Presentation

	Read About: 1. How are we able to see the Moon? 2. Why does the Moon appear to change shape? TTW assign a *Foldable* activity to take notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.*	**Read About:** 1. How does the Moon move? 2. Why does the Moon appear to change shape? SW add to *Foldable* notes *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.*	**Revisit Science Probe: Phases of the Moon** (Detailed instructions can be founded in TE) **Teacher Choice Activity:** Pivot Sim: Phases of the Moon (MS) In this activity, students will use a Pivot Sim to explore the phases of the Moon as viewed from Earth.	the phase names, the sequence in which they occur, and a way to distinguish waxing and waning phases. **Extension** explores the remarkable fact that we always see the same face of the Moon. This happens because the Moon rotates (spins) at exactly the same rate that it revolves around Earth. *When students are completing a Gizmo online simulation, the teacher should be actively circulating the classroom, checking in on students' screens to ensure they are engaging with the simulation as intended and following the instructions accurately. The teacher should also be asking targeted questions and providing support to help students understand the concepts being explored, ensuring they stay focused and on-task.*	**Lab: Beyond a Shadow of Doubt** SW observe the umbra and penumbra of a shadow and compiler lab. *Teacher can show a lab video of Beyond a shadow of Doubt* *When students are completing a lab, the teacher should be actively monitoring the students' work to ensure they are following procedures safely and correctly, offering guidance and support as needed. Additionally, the teacher should be assessing students' understanding through observation and asking probing questions to facilitate critical thinking and deeper comprehension.* **Teacher Choice Activity:** Reading Essential: Eclipses
Assessment Summary	TOD: Answer the following questions: Students study the photos and read the paragraphs about lunar phases What is the apparent shape of the full moon? What produces the phases of the Moon? Have students identify what	**(* Located in textbook)** **Explore and Explain** 3D Thinking: How does the Moon move? TTW evaluate student argument for accuracy.	TOD (Quick Write) Respond to these questions in the form of a quick-write 1. What are some of the key findings from the LRO spacecraft's mission? 2. What evidence was found that there is water on the Moon?	TOD:Completes the 5 questions assessment on the bottom of the Gizmo digital simulation platform and summarize the Gizmo activity	TOD:(Reflection*)* Summarizes the key points covered in the lesson. Answer the following question: Why Isn't There an Eclipse Every Month?

	the parts of the model they used in the lab represent. Reinforce: How do the Moon's phases occur in consistent and regular patterns ?				
Small Group Tasks (TBA)					

Week 6					
GSE: **S6E2a**. Develop and use a model to determine the phases of the moon by showing the relative positions of the sun, earth, and moon. **S6E2b.** Construct an explanation of the cause of solar and lunar eclipses. **S6E2c.** Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.	**Focused Concept:** Earth moves around the sun in its orbit, and it takes approximately 365 days to make one entire revolution around the sun. However, this is not the only way Earth moves in its orbits. The Earth also spins on its axis. The spin of the earth on its axis accounts for our day length of approximately 24 hours. One theory is that Earth is tilted on its axis because at some point in the history of Earth, something very large struck the planet, knocking it off its orbital axis. That is how the Earth becomes tilted on its axis. The axis always points in the same direction as Earth orbits the sun, and the tilt of the axis is about 23,5 degrees relative to the orbital plane. Due to the tilt at various points in the Earth's orbits around the sun, different parts of the Earth's surface receive more sunlight than others. It is important to note that because of the 23.5-degree tilt, the poles never directly point toward the sun, but are angled toward or away from the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of the Earth across the year. Axis Climate Direct sunlight Equinox Indirect sunlight Orbit Revolution Seasons Tilt ***The teacher will access Module: The Sun-Earth-Moon System - Lesson 1: Earth's Motion Around the Sun for online instruction and assign activities used for the instructional week.***				
SEP: Analyzing and Interpreting data	**CCC:** Patterns; Cause and Effect				
Phenomenon: What causes the seasons? **Reasons for the Seasons**			**DQ:** What causes the cyclic pattern of the seasons?		

Learning Target:	**Day 26**	**Day 27**	**Day 28**	**Day 29**	**Day 30**
The students will be able to (SWBAT)	**SWBAT** explain the cause of the seasons.	**SWBAT** explain the cause of the seasons**.**	**SWBAT** explain the cause of the seasons.	**Review**	**Review**
Opening	**(* Located in textbook)**	TTW introduce the topic	**(* Located in textbook)**	TTW conduct a review	TTW begin the lesson by

	Science Probe: Seasons TTW use this science probe to assess students' prior knowledge of the lesson content and to identify possible preconceptions. **Engage: Encounter the Phenomenon:** **Earth Motion Around the Sun** <u>Phenomenon: What causes the seasons?</u> SW watch the video *Seasons* to see this phenomenon in action SW complete the Communicate activity	by asking students about their understanding of the reasons for the seasons. How do the movements of the Sun, Earth, and the Moon influence the seasons, phases, and eclipses? Show video and complete STW protocol with students. Eclipses:https://youtube.com/shorts/XvOEv5-YI_Q?si=HB3QRR1kCGGUkFft Show a video showcasing different seasons to visually engage students. One year in 40 seco… Provide students with an image to explore and use the See-Think-Wonder protocol to guide their initial thoughts. After initial exploration, guide students toward key questions: ● Why do we have different seasons? ● How does the temperature change throughout the year? ● Why does it take 365 days for all four seasons to occur? *Require students to use	**Explore and Explain** SW complete Go Online Interactive Presentation **Lesson Review: Earth's Motion Around the Sun** TTW review the concepts for Earth's Motion Around the Sun	game from concepts taught such as seasons, solar and lunar eclipses. Competitive Game: "Moonshot Challenge" Game Rules and Questions	inviting students to ask any lingering questions they have about the assessment.

		evidence from the information provided and prior lessons when answering the above questions			
Guided Practice/ Transition	**(* Located in textbook) Explain and Explore** SW complete Go Online Interactive Presentation **Investigation: Night and Day** SW use a model of the Sun and Earth to infer the cause of night and day. *The teacher should circulate to monitor their progress and ask probing questions to help them think critically about their findings. Additionally, the teacher should provide guidance on interpreting data accurately and drawing evidence-based conclusions.*	TTW introduce the Gizmo and demonstrates its basic operations. Teacher Guide: Seasons in 3D SW complete Seasons in 3-D Gizmo Warm-Up. Discuss the differences in seasons between the Northern and Southern Hemispheres. SW engage in academic discourse with peers about their understanding of the reasons for the seasons.	**(* Located in textbook) Evaluate** SW complete Go Online Interactive Presentation TTW review concepts for Reasons for the Seasons **Lesson Check: Earth's Motion Around the Sun** **LearnSmart: The Sun-Earth-Moon System**	TTW review Unit 1 Assessment Prep Presentation. Unit 1 Assesment Prep TTW review concepts taught from week 1 to week 6. SW jot down answers and explanations to questions as the class discusses the reasoning/ evidence to support each correct answer.	**Unit 1 Assessment in Illuminate.**
Independent Practice	**(* Located in textbook) Explore and Explain** SW Go Online Interactive Presentation: **Read About**: 1. How does the Earth move? 2. Why does the view of the sky change over time? 3. Why is Earth warmer at the equator and colder at the poles? 4. Why do Earth's seasons change as Earth orbits the	SW complete *Seasons in 3D* Gizmo in student exploration sheet. **Part A** - Students relate the position of Earth's axis at different times of the year to Earth's seasons. **Part B** - Students determine why summer is hotter than winter. Student Handout Student Handout Google Doc	SW complete a review of the Reasons for the Seasons Concept Mapping: Divide the class into small groups. Provide each group with a whiteboard or chart paper and markers. Ask them to create a concept map illustrating the reasons for the seasons. Encourage students to include key concepts such as the tilt of the Earth, the angle of sunlight, and the relationship between sunlight distribution and seasonal changes.	SW complete review Unit 1 Choice board. Copy of Solar Syste…	**Unit 1 Assessment in Illuminate.**

	sun? 5. What is Earth's seasonal cycle? TTW assign a *Foldable* activity to take notes. *When students are doing independent or group reading and taking notes, the teacher should circulate around the room to monitor their progress and ensure they are engaged. The teacher should periodically review their notes, offering feedback and guidance on identifying and extracting key information and main ideas effectively.*		Circulate among the groups to provide guidance and support as needed. **Teacher Choice Activity:** Pivot Sim: Solar Radiation and Earth's Seasons. Explore how energy from the Sun (solar radiation) affects Earth's climate over the course of a year.		
Assessment Summary	TOD: (Writing Prompt) What are the reasons for the seasons? TTW refer to the TE Engage the students in a class discussion about the illustration and writing prompt for the reasons for the seasons	TOD: Complete a 5-question assessment at the end of the Gizmo to gauge comprehension and retention of the material. TTW and SW ● Review the Seasons in 3D exploration sheet	TOD: TTW Engage class in a brief overview of the day's lesson and address common misconceptions teacher may have heard or noticed during the day's tasks. . Provide feedback to students as a class, addressing any misunderstandings and reinforcing key concepts.	TOD:(Self-Assessment) On a scale of 1 to 5, how prepared do you feel for the assessment tomorrow? Please explain your rating.	TOD: SW answer the following reflection questions: 1. How well did you know the material? Which questions did you struggle with the most? 2. What activities and tasks helped to prepare you for the assessment?
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep Presentation.

Unit 1 Assesment Prep

Provide the following guidance:
Ask the students to use what they know about the tasks completed to answer the provided assessment prep question.

- What is the question asking you?
- What do you know about the vocabulary or concept in the question?

- Is this question similar to any investigations or tasks we've completed?
- How can what you've done help you answer this question?
- Just view the assessment question: What is the question asking you?

Guide students to think about how their experience connects to the question.
Using the answer choices provided, ask the students the following:

- Identify a wrong answer: How do I know this answer is incorrect?
- Identify the right answer: How do we know this answer is correct?

Allow the students time to discuss in collaborative groups.

TEACHER NOTE: If students struggle with the question, review it the next day. Do not rush to the next question; instructional time is the only time they have to prepare for the end-of-year assessment.

Labs / Investigations		
Mandatory Labs	**Explore Learning Gizmo**	**Pivot Interactives/Phet**
Lab: Model the Inner Planets Lab: Changing Shapes Lab: Beyond a Shadow of Doubt Lab: Moon Phases	Explore Learning Gizmos ○ Solar System ○ Gravity Pitch ○ Phases of the Moon ○ Seasons in 3D	The Expanding Universe Solar Radiation and Earth's Seasons Pivot Sim: Phases of the Moon (MS)

Additional Resources/Tasks	
Supplemental Resources	Department of Science Guidance Document Geocentric to Heliocentric Video Planets of the Solar System NASA's Space Place "What is Gravity?" First Comet of 2016 Comet Catalina Visible at Sunrise Online Scale Model Calculator Less Than Five - What's the Difference Between Comts, Asteroids, Meteoroids, Meteors & Meteorites **GaConnects is a new one-stop-shop site for Georgia educators built to provide quick access to GaDOE educational resources, Georgia Standards, data dashboards, professional learning, and GaDOE applications. GaDOE SuitCASE and GaDOE Inspire are two featured applications to support classroom Instruction. Click on "GaConnects Preview" in the SLDS for access, or go to Inspire (gadoe.org).**