

**Domain-Based Unit Overview**

Title of Domain: Modeling Earth's Systems

**Big Idea**

*This unit focuses on the scientific concept that Earth systems are dynamic and that they interact.*

**What Students Need to Learn**

*You can find the Focus on the Main Idea at the start of every lesson.*

1. Spheres of the Earth
2. Modeling Earth's Systems

**MN Academic Standards (2019)**

**Pre-Assessment**

- 1) What can you tell me about Earth?
- 2) What are Earth's Systems?
- 3) How do systems interact with one another?

<b>Domain Chapter 1</b>	Living Things Grow and Change (4 Days)
<b>MN Academic Standards</b>	
<b>Objectives</b>	<p>✓Classify components of Earth's features as land, water, air, and living things</p> <p>✓Describe what makes up the hydrosphere</p>
<b>Vocabulary</b>	hydrosphere, salt water, ground water, reservoir, fresh water, dynamic, and water cycle
<b>Procedure</b>	<p>Day 1</p> <ol style="list-style-type: none"> <li>1) Teacher asks class the three pre-assessment questions.</li> <li>2) Introduce unit by discussing what the four spheres and how they interact with Earth.</li> <li>3) Review chapter one vocabulary and objectives.</li> <li>4) Teacher introduces the big question: What is the hydrosphere?</li> <li>5) Popcorn Read: Chapter 1</li> <li>6) As students are reading stop periodically to ask the comprehension questions from in the Teacher's guide.</li> </ol>

	<p>7) Teacher asks, “What is the hydrosphere?” Have students raise hand and share.</p> <p>8) Introduce and have students work on activity 1.1. Students will complete as homework.</p> <p>Day 2</p> <p>1) Teacher asks, “What is the hydrosphere?”</p> <p>2) Introduce Water Filter Challenge</p> <p style="padding-left: 40px;">a) Students will work with their table mates to create a filtering system that can take dirty water and filter at least a half cups worth of clean water.</p> <p style="padding-left: 40px;">b) Students will have a seven dollar budget to consider when designing their filter system.</p> <p style="padding-left: 40px;">c) Groups will have 25 minutes to solve this challenge.</p> <p>3) Teacher: Track groups spending on a white board</p> <p>4) Have students work on challenge for 25 minutes</p> <p>5) Large group discussion after 25 minutes.</p> <p style="padding-left: 40px;">a) Visit each table and have each group discuss the materials they used and their results.</p> <p>6) Have each student complete the “Water Filter Design” packet.</p> <p>7) Exit ticket: How is the hydrosphere and the Water Filter Challenge connected?</p> <p>Day 3</p> <p>1) Review: Why is important that we find ways to preserve and reuse the freshwater on Earth?</p> <p>2) Teacher Demonstration: Students will be learning about Earth’s water supply. To complete demonstration follow activity 3.1 in the Teacher’s Guide.</p> <p>3) As a large group complete activity 3.2 together.</p> <p>Day 4</p> <p>1) Complete activity 3.2 as a large group review what was learned from the demonstration yesterday.</p> <p>2) Students will complete activity 3.3 from the Teacher’s guide independently by showing their understanding about the hydrosphere and Earth’s water supply.</p>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 2</b>	The Geosphere (4 Day)
<b>MN Academic Standards</b>	

<b>Objectives</b>	<p>✓ Describe what makes up the geosphere</p> <p>✓ Describe the three types of rocks: sedimentary, igneous, and metamorphic</p> <p>✓ Describe the “Rock Cycle”</p>
<b>Vocabulary</b>	geosphere, geologic, sediments, seismic waves, and rock cycle
<b>Procedure</b>	<p>Day 1</p> <ol style="list-style-type: none"> <li>1) Review: What is the Earth System that we learned about the past few days?</li> <li>2) Teacher: Introduce the next Earth system: Geosphere</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: What is the geosphere?</li> <li>5) Split class in half and have each group read chapter 2 outloud.</li> <li>6) Exit Ticket: Have each group write on the white board the answer to “What is the geosphere?”</li> </ol> <p>Day 2</p> <ol style="list-style-type: none"> <li>1) Review: What is the geosphere?</li> <li>2) Teacher: Introduce lesson today on modeling the Earth’s Geosphere.</li> <li>3) Teacher Demonstration: Teacher will demonstrate the different layers of the Earth with a peach. The name of the layers can be found in chapter 2 of the student reader.</li> <li>4) Students will complete activities 4.1 and 4.2 to show understanding of the layers of Earth.</li> </ol> <p>Day 3</p> <ol style="list-style-type: none"> <li>1) Review:             <ol style="list-style-type: none"> <li>a) What are the layers of the geosphere?</li> <li>b) What is the hydrosphere?</li> </ol> </li> <li>2) Teacher: Introduce lesson today on the types of rocks and the rock cycle.</li> <li>3) Types of Rocks Video: <a href="https://www.youtube.com/watch?v=pg_jKJFbA2A">https://www.youtube.com/watch?v=pg_jKJFbA2A</a></li> <li>4) Have students complete notes on the three types of rocks: sedimentary, igneous, and metamorphic and how each are formed.</li> <li>5) Teacher: Discuss how these three types of rocks make up the rock cycle. Display the rock cycle on the SmartBoard. Discuss each part of the cycle with the class.</li> <li>6) Have students complete the Rock Cycle Doodle Notes and glue the information into their science notebooks.</li> <li>7) Exit Ticket: Share with your elbow part your favorite type of rock and why?</li> </ol> <p>Day 4</p> <ol style="list-style-type: none"> <li>1) Review: What are the three types of rocks?</li> </ol>

	<ol style="list-style-type: none"> <li>2) Teacher: Introduce “Starburst Rock Cycle” lab</li> <li>3) Note: This lab uses equipment that get hot. Share the safety requirement and expectations for this lab before beginning.</li> <li>4) Hand out lab directions and starbursts candy. Students will complete lab independently while the teacher remains near the hot plate.</li> <li>5) Exit Ticket: How has this lab help you understand the rock cycle?</li> </ol>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 3</b>	What is the atmosphere? (2 Days)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ <i>Describes what makes up the atmosphere</i>
<b>Vocabulary</b>	atmosphere, air pressure, altitude, and air mass
<b>Procedure</b>	<p>Day One</p> <ol style="list-style-type: none"> <li>1) Review: What is the Earth System that we learned so far?</li> <li>2) Teacher: Introduce the next Earth system: Atmosphere</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: What is the atmosphere?</li> <li>5) Small group read chapter3.</li> <li>6) Have each group answer the following questions on a piece of lined paper.             <ol style="list-style-type: none"> <li>a) Why can we see clouds but not water vapor in the atmosphere?</li> <li>b) Which two systems interact when air supports life?</li> <li>c) In which part of the atmosphere is there enough air for living things to use?</li> <li>d) What is the relationship between air pressure and altitude?</li> <li>e) How do air masses produce weather?</li> </ol> </li> <li>7) Exit Ticket: What is the atmosphere?</li> </ol> <p>Day Two</p> <ol style="list-style-type: none"> <li>1) Review:             <ol style="list-style-type: none"> <li>a) What is the atmosphere?</li> <li>b) What is the geosphere?</li> <li>c) What is the hydrosphere?</li> </ol> </li> <li>2) Teacher: Introduce center activity focused on the hydrosphere.             <ol style="list-style-type: none"> <li>a) Centers                 <ol style="list-style-type: none"> <li>i) Summarize the article</li> <li>ii) “Atmosphere Graffiti Wall”</li> </ol> </li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>iii) Interpret the data</li> <li>iv) Create a scale model of the Earth's Atmosphere Layers</li> <li>v) Atmosphere Challenge Cards</li> </ul> <ul style="list-style-type: none"> <li>3) Review expectations of working at centers and how students will rotate when it is time.</li> <li>4) Students will complete each center. Teacher will divide class time for students to visit each center and have time to complete exit ticket.</li> <li>5) Exit Ticket: <ul style="list-style-type: none"> <li>a) Which center did you enjoy the most? Why?</li> <li>b) Which center did you find challenging? Why?</li> </ul> </li> </ul>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 4</b>	The Biosphere (2 Days)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ <i>Describe what makes up the biosphere</i>
<b>Vocabulary</b>	biosphere, extinct, biome, biodiversity, species, and taxonomy
<b>Procedure</b>	<p>Day One</p> <ul style="list-style-type: none"> <li>1) Review: What is the Earth System that we learned so far?</li> <li>2) Teacher: Introduce the next Earth system: Biosphere</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: What is the biosphere?</li> <li>5) Large group read chapter 4.</li> <li>6) Ask the comprehension questions found in the teacher's guide as you read chapter 4.</li> <li>7) Students will complete activity 6.1 from the teacher's guide independently to show understanding of the biosphere.</li> <li>8) Exit Ticket: What is the biosphere?</li> </ul> <p>Day Two</p> <ul style="list-style-type: none"> <li>1) Teacher: Today we will review Earth's four systems with a PowerPoint and Walk About.</li> <li>2) Teacher: Complete PowerPoint and notes sheet with class.</li> <li>3) Exit Ticket: What can you tell me about each of the four Earth's systems?</li> </ul>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>

<b>Writing</b>	<i>If Applicable</i>
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<b>Domain Chapter 5</b>	Hydrosphere Interactions (1 Day)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ Describe how the hydrosphere interacts with other spheres
<b>Vocabulary</b>	weathering, erosion, and deposition
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1) Review: What are Earth's four systems?</li> <li>2) Teacher: Each of the four systems not only interact with Earth, but they also interact with one another. Today we will learn how the hydrosphere interacts with other spheres.</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: How does the hydrosphere interact with other spheres?</li> <li>5) Clock partner read chapter 5.</li> <li>6) Partner Activity: Each partnership will receive a set of sorting cards. These cards should be sorted into the following categories: erosion, weathering, or deposition. Once they have sorted all the cards the teacher will come and check to make sure they have sorted them correctly.</li> <li>7) Introduce activities 8.1 and 8.2 which students will complete as homework</li> <li>8) Exit Ticket: How does the hydrosphere interact with other spheres?</li> </ol>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 6</b>	Geosphere Interactions (1 Day)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ Describe how the geosphere interacts with other spheres
<b>Vocabulary</b>	Rain shadow, aquifer, water table, soil, inorganic, organic, and minerals
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1) Review: How does the hydrosphere interact with other spheres?</li> <li>2) Teacher: Today we will learn how the geosphere interacts with other spheres.</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: How does the geosphere interact with other spheres?</li> </ol>

	<ol style="list-style-type: none"> <li>5) Whole class read chapter 6.</li> <li>6) Teacher: Ask the discussion questions found in the teacher's guide.</li> <li>7) Introduce activities 9.1 and 9.2 which students will complete as homework</li> <li>8) Exit Ticket: How does the geosphere interact with other spheres?</li> </ol>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 7</b>	Atmosphere Interactions (2 Day)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ <i>Describe how the atmosphere interacts with other spheres</i>
<b>Vocabulary</b>	deposition, respiration, and cellular respiration
<b>Procedure</b>	<p>Day 1</p> <ol style="list-style-type: none"> <li>1) Review: How does the geosphere interact with other spheres?</li> <li>2) Teacher: Today we will learn how the atmosphere interacts with other spheres.</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: How does the atmosphere interact with other spheres?</li> <li>5) Small group read chapter 7.</li> <li>6) Small group activity: Students will work with their group members to complete activity 10.2.</li> <li>7) Exit Ticket: How does the atmosphere interact with other spheres?</li> </ol> <p>Day 2</p> <ol style="list-style-type: none"> <li>1. Review: How does the atmosphere interact with other spheres?</li> <li>2. Teacher: We have learned how the different spheres interact with one another. Today we will have a S.T.E.M. challenge that focuses on the interaction between the atmosphere and hydrosphere. Working with your table members you will have twenty dollars to build a hurricane tower to withstand the power of air and water while holding a ball on it.</li> <li>3. Teacher: You will have 25 minutes to complete this challenge.</li> <li>4. Students will begin to work on their challenges. Keep track of the amount of money each group spends on a white board.</li> <li>5. Test each design and have students discuss what went well and what they struggled with as a group.</li> <li>6. Have students complete the "Hurricane Tower Challenge" packet.</li> </ol>

<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 8</b>	Biosphere Interactions (1 Days)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ <i>Describe how the biosphere interacts with other spheres</i>
<b>Vocabulary</b>	transpiration and toxins
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1) Review: How does the biosphere interact with other spheres?</li> <li>2) Teacher: Today we will learn how the biosphere interacts with other spheres.</li> <li>3) Review chapter vocabulary</li> <li>4) Big Question: How does the biosphere interact with other spheres?</li> <li>5) Read with an elbow partner chapter 8.</li> <li>6) Have students complete activity UR.1 from the teacher's guide.</li> <li>7) Exit ticket: How does the biosphere interact with other spheres?</li> </ol>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 9</b>	Biosphere Interactions (2 Days)
<b>MN Academic Standards</b>	
<b>Objectives</b>	✓ Fluently discuss Earth's spheres and their interactions.
<b>Vocabulary</b>	
<b>Procedure</b>	<p>Day 1</p> <ol style="list-style-type: none"> <li>1) Review: How do Earth's systems interact with one another?</li> <li>2) Teacher: Today we will review each sphere and how they interact with one another.</li> <li>3) Big Question: Is it possible that there is another planet somewhere that has the right combination of features to support life?</li> <li>4) Read chapter 9 independently.</li> <li>5) Exit ticket: Have students write a paragraph answer the big question "Is it possible that there is another planet somewhere that has the right combination of features to support life?"</li> </ol>

	6) Have students independently complete activity UR.2 in the teacher's guide. Day 2 1) Students will complete the "Unit Assessment" found in the teacher's guide.
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>

<b>Domain Chapter 10</b>	Classification of Living Organisms (1 Day)
<b>MN Academic Standards</b>	
<b>Objectives</b>	<p>✓ <i>I can divide living things into five large groups called kingdoms.</i></p> <p>✓ <i>I can divide groups into smaller groups as follows: kingdoms, phylum, class, order, family, genus, and species.</i></p> <p>✓ <i>I can explain the difference between a common name and scientific name.</i></p>
<b>Vocabulary</b>	taxonomy
<b>Procedure</b>	<p>Day 1</p> <ol style="list-style-type: none"> <li>1) Teacher: When learning about the biosphere we briefly discussed taxonomy. For the next five days we will be digging into taxonomy further to help us understand how and why we classify organisms.</li> <li>2) Video: <a href="https://www.brainpop.com/science/diversityoflife/classification/">https://www.brainpop.com/science/diversityoflife/classification/</a></li> <li>3) Teacher: Present the "Classification" PowerPoint. Complete the slides titled: Taxonomy, Classification, and The Five Kingdoms.</li> <li>4) Activity: To help us understand the process of classifying organisms based on different characteristics we will complete part one of the activity titled "Alien Classification."</li> </ol> <p>Day 2</p> <ol style="list-style-type: none"> <li>1) Review:             <ol style="list-style-type: none"> <li>a) Who can explain why organisms are classified into different kingdoms?</li> <li>b) What are the five kingdoms we learned about yesterday?</li> </ol> </li> <li>2) Video: <a href="https://www.youtube.com/watch?v=uZ7b3jerbMQ">https://www.youtube.com/watch?v=uZ7b3jerbMQ</a></li> <li>3) Teacher: Today we will continue to learn about the different stages of taxonomy. The next step we will focus on is the</li> </ol>

	<p>phylum. Share some of the most common ways species are sorted here (example: have a backbone or do not have a backbone).</p> <ol style="list-style-type: none"> <li>4) Complete part 1a and 1b in the “Alien Classification” activity.</li> <li>5) Introduce the next step “Class”. Share some of the most common ways species are sorted here (example: mammals, birds, reptiles, fish, etc.)</li> <li>6) Complete the remaining parts of the “Alien Classification” activity.</li> </ol> <p>Day 3</p> <ol style="list-style-type: none"> <li>1) Review: What are the three ways we learned to classify organisms yesterday?</li> <li>2) Teacher: Today we will continue learning about the different steps used to classify organisms. The next step we will focus on is order. Share some of the most common ways species are sorted here (example: carnivores, herbivores, or omnivores).</li> <li>3) Teacher: The next step is family. Share some of the most common family names (example: Felidae (cat))</li> <li>4) Teacher: The next step is Genus. Share some of the most common species names (example: can purr, does not roar).</li> <li>5) Teacher: The last step is Species. Share some of the most common species names (example: homo sapien, felis domesticus)</li> <li>6) Discuss the difference between a common name and scientific name of an organism. (Example-common name: domestic cat Scientific name: felis domesticus)</li> <li>7) Activity: Students will create a way they can classify themselves using the 7 levels. Example: Kingdom (MN Schools) Phylum (WLA) Class (Grade) Order (Teacher) Family (Gender) Genus (Ethnicity) Species (First and last name)</li> <li>8) Exit Ticket: Share your classifying of yourself with the person across from you.</li> </ol> <p>Day 4</p> <ol style="list-style-type: none"> <li>1) Review: What are the 7 levels of classification we learned about yesterday?</li> <li>2) Teacher: Today we will create a mnemonic device to help us remember each level.</li> <li>3) Hand “Mnemonic for Classification” activity. Walk through the activity with the class and then provide students 10-15 minutes of work time.</li> </ol>
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	<p>4) When students have completed the mnemonic device activity they may find a partner and complete chart 1 from the “Classification of Living Things” activity. Explain how to complete the activity with groups as they finish. Continue to walk around the room to answer questions. If students finish early they can complete chart 2.</p> <p>5) As a class review each section of chart one, excluding different organisms as you continue section to section. It is recommended that you have a set of cards taped on a white board to remove as you go.</p> <p>6) Exit Ticket: What was the challenges you encountered today completing the chart 1 activity?</p> <p>Day 5</p> <p>1) Review: What is the difference between a common name and scientific name of an organism?</p> <p>2) Teacher: Tomorrow we will have a quiz on what we have learned about classifying different organisms. To help prepare you for the quiz we will complete a review guide today.</p> <p>3) Hand out review guide</p> <p>4) Have students work alone to complete the review guide.</p> <p>5) When guides have been completed students may review with a partner or small group for the quiz tomorrow. This will provide students the opportunity to ask questions and check their answers.</p> <p>6) Exit Ticket: Why do we classify organisms?</p> <p>Day 6</p> <p>1) Students will complete a quiz on taxonomy.</p>
<b>Poetry</b>	<i>If Applicable</i>
<b>Fiction</b>	<i>If Applicable</i>
<b>Saying and Phrases</b>	<i>If Applicable</i>
<b>Writing</b>	<i>If Applicable</i>