Domain-Based Unit Overview

Title of Domain: Protecting Earth's Resources

Big Idea

This unit focuses on human use of natural resources and scientific ideas and technology that can be used to protect Earth's resources over time.

What Students Need to Learn

- *Establish a problem-solving mindset as the unifying theme for the unit.*
- *Protecting Earth's Water*
- *Protecting Earth's Air*
- *Protecting Earth's Land*
- *Taking Local Action*

MN Academic Standards (2019)

5L.4.1.2.1

Pre-Assessment

1) What can you tell me about Earth?
2) How do we protect Earth's air, water and land?

Domain Chapter 1	Water Resources (2 Days)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓*Define natural resources.* ✓*Describe a source people can use to find information about water, air, and land.* ✓*Establish problem-solving mindset as the unifying theme for the unit.* ✓*Identify why water is important for all living things.* ✓*Explain how humans can affect water in positive and negative ways.* ✓*Describe the process that people can use to clean wastewater.*
Vocabulary	algal bloom, disinfection, water quality testing, bacteria. wastewater water, and treatment plant
Procedure	Day 1 1. Teacher: Introduce the next unit which focuses on taking care of our planet. Ask students pre-assessment questions.

	2. Introduce chapter vocabulary and the big questions "What is water quality?"
	3. Large group read chapter 1 outloud and complete the discussion questions found in lesson 2 of the teacher book.

	4. Exit Ticket: Have students work with a partner to think about why scientists are concerned about human activities that affect the quality of water. To focus students' thinking, ask the following questions:
	    a. What kinds of human activities could affect the quality of water?
	    b. In what ways could water be affected by human activities?
	    c. What is air quality?
	    d. What are algae?
	
	Day 2
	1. Review exit ticket questions from day one as a large group
	2. Introduce community activity board project (lesson 1 in teacher guide) and have students complete activity 1.1 (pg 132)
	3. Have student complete activities 2.1 (pg 135) and activity 2.3 (pg 137)

Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*

Domain Chapter 2	Water Resources, Problems, and Solutions (3 Day)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓*Describe the importance of water to all living things.* ✓*Obtain information from reliable sources to describe evidence of positive and negative relationships between human activity and Earth's water resources.* ✓*List several sources of water pollution and describe how each harms the environment and human health.* ✓*Describe how people have used scientific ideas and technology to protect water resources.*
Vocabulary	conserve, groundwater, pollutant, water pollution, fresh water, pathogen, and surface water
Procedure	Day 1 1. Teacher: Review: Why is too much algae a problem? 2. Introduce chapter vocabulary and the big questions "How can human activities affect the quality of water?"

3. Large group read chapter 2 and complete the discussion questions found in lesson 3 of the teacher book.
4. Exit Ticket: Have students answer the big question "How can human activities affect the quality of water?" with their table groups.

Day 2

1. Review: "How can human activities affect the quality of water?"
2. Today we will be investigating how water pollution spreads. We will begin with some class brainstorming on the following topics:
   a. How does pollution get into the ocean?
   b. How does pollution affect plants and animals when it enters the ocean?
3. Distribute How Pollution Spreads (AP 4.2 pg. 141). Explain that the activity will help students think about the impact of a point source of pollution on the environment. Ask students to work in small groups. Give each group a set of the materials. Describe the procedure each group should follow:
   a. Place the container on a flat surface.
   b. If needed, wash the pebble to clean it of any dirt or mud. Place the pebble in the middle of the container.
   c. Add enough water to the container to fill it about halfway. The water should not cover the pebble.
   d. Put the ice cubes in one corner of the container. (The ice cubes should not move around. If needed, cover the cubes with a paper towel to stop them from moving.)
   e. Wait for the water to settle. Do not blow on the water or touch the container.
   f. Add several drops of food coloring to the top of the pebble, until some of the food coloring enters the water.
   g. Record your observations.
   h. Use the paper towels to clean up your workspace or any spills.
4. Exit Ticket: Ask each student the following question: How does water pollution spread?

Day 3

1. Teacher: Yesterday we learned about how water pollution spreads. Today we will focus on ways that water pollution can be removed. A huge problem that large bodies of water encounter is oil spills.
2. Hand out lab "Oil Spill Clean Up". Have each student complete with their table partners.
3. Exit Ticket: What tool did you find worked best for removing oil? Why?
4. Homework: Students will complete activity 5.2 (pg 145)

Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*

Domain Chapter 3	Air Pollution (1 Day)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓ *Describe the importance of air to all living things.* ✓ *Obtain information from reliable sources to describe evidence of positive and negative relationships between human activity and air pollution.* ✓ *Describe how people have used scientific ideas and technology to reverse air pollution.*
Vocabulary	air pollution, and smog

Procedure	1) Review: Why is it important to protect Earth's water?
	 2) Teacher: Introduce the next section which will focus on the effects of human activities on air quality.
	 3) Introduce chapter three vocabulary and the big question: "What is air pollution?"
	 4) Small group read chapter 3.
	 5) Have each group answer the following questions on a piece of lined paper.
	     a) What are some ways that air can become polluted?
	     b) What are some effects of air pollution on humans?
	     c) How could deforestation affect air quality?
	 6) Begin lab "Testing Air Quality" (Activity 6.1, pg. 146)
	 7) Exit Ticket: What is the air pollution?

Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*

Domain Chapter 4	The Need for Clean Air (2 Days)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓ *Describe how human activity affects air quality.* ✓ *Find the Air Quality Index for your location.* ✓ *Measure particles of air pollution at school.*

Vocabulary	air quality, clean energy, pollutant, Air Quality Index, and ozone
Procedure	1. Review: What is air pollution? 2. Teacher: Complete "Testing Air Quality" lab (Activity 6.1, pg 146) 3. Introduce chapter four vocabulary and the big question: "How can human activity affect the quality of air?" 4. Class group read chapter 4 and answer the discussion questions found in lesson 7 of the teachers guide. 5. Complete Activity 8.1 (pg 148) as a class using the SmartBoard to look up information. 6. Complete Activity 9.1 (pg 149) with table groups 7. Homework: Activity 7.1 (pg 147) 8. Exit Ticket: How can human activity affect the quality of air?
Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*

Domain Chapter 5	Land Contamination (1 Day)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓*Describe the importance of land to all living things.* ✓*Describe how people have used scientific ideas and technology to help prevent land contamination.*
Vocabulary	biodegradable, contaminated land, and landfill

Procedure	1) Review: How do companies remove air pollution?
	 2) Teacher: Today we are going to investigate human activities that contaminate land.
	 3) Introduce chapter 5 chapter vocabulary and the Big Question: What is land contamination?
	 4) Clock partner read chapter 5 and answer the following discussion questions with their partner.
	     a) Are there any ways to reduce the amount of garbage that goes into the landfill?
	     b) Even though items can be recycled, such as plastic water bottles, why is it important to use less of these too?
	     c) Why is a landfill often built nearby a water treatment plant?
	     d) How long can it take for a landfill to become full?
	     e) What happens to a landfill after it is full?
	 5) Homework: Making a Waste-Free Lunch (Activity 10.1 pg 152)

	6) Exit Ticket: What is land contamination?
Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*

Domain Chapter 6	Living Off the Land (1 Day)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓ *Describe ways that living things depend on land.* ✓*Describe the positive and negative effects of human activity on land.*
Vocabulary	biodegradable, green space, survey, crop rotation, and no-till farming

Procedure	1) Review: Have students turn to Activity 10.1 (pg 152) and walk around and look at one another's images.
	   a) What do all of these lunches have in common?
	   b) Do you think it would take more time or more money to pack a waste-free lunch?
	2) Teacher: Today we will continue to learn about land contamination.
	3) Introduce chapter six vocabulary and the Big Question: How can human activity contaminate land?
	4) Whole class read chapter 6. Teacher will ask the discussion questions found in the teacher's guide lesson 11.
	5) Homework: Activity 13.1 (pg 157)
	6) Exit Ticket: As a table group answer the following questions.
	   a) What are the effects of soil erosion?
	   b) What resources are mined?
	   c) How can human activity contaminate land?

Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*

Domain Chapter 7	Sharing the Environment (2 Days)
MN Academic Standards	*5L.4.1.2.1*
Objectives	✓ Describe an example of an ecosystem, including ways in which components of the system interact.

	✓ Obtain information from reliable sources to explain positive and negative relationships between human activity and ecosystems, including living and nonliving resources.
Vocabulary	biodiversity, ecosystem, and interaction

Procedure	Day 1
	  1) Review: Have students share their land plan (activity 13.1 pg. 157) with table groups.
	  2) Teacher: Today we will investigate the effects of human activities on ecosystems.
	  3) Review chapter seven vocabulary and the Big Question:How do human activities that affect water, air, and land impact ecosystems?
	  4) Large group read chapter 7 and discussion comprehension questions found in lesson 13 of the teacher's guide.
	  5) Class Activity: Activity 15.3 (pgs. 163-164)
	  6) Homework: Activity 15.1 (pg. 161)
	  7) Exit Ticket: How do human activities that affect water, air, and land impact ecosystems?
	Day 2
	  1. End of unit assessment
	    a. Write a paragraph on each of the following questions. Make sure student's paragraphs include details showing what they have learned throughout the unit.
	      i. How can we protect land ecosystems from negative consequences of human activities?
	      ii. How do human activities that affect water, air, and land impact ecosystems?
	      iii. How can we protect an ecosystem from negative consequences of human activities?

Poetry	*If Applicable*
Fiction	*If Applicable*
Saying and Phrases	*If Applicable*
Writing	*If Applicable*