

Pesky Pollution: Types, Causes, and Solutions

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Grade Level 2
Duration 4 - 5 class periods

National Standards

GEOGRAPHY

Element 5: Environment and Society

14. How human actions modify the physical environment

Element 6: The Uses of Geography

18. How to apply geography to interpret the present and plan for the future

AZ Standards

ELA

Reading

Key Ideas and Details

2.RI.3 With prompting and support, describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

Craft and Structure

2.RI.4 Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area

Writing

Text Types and Purposes

2.W.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

2.W.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations)

2.W.8 Recall information from experiences or gather information from provided sources to answer a question

SCIENCE

2.E1U3.7-U3 Applications of science often have both positive and negative ethical, social, economic, and political implications. Construct an argument from evidence regarding positive and negative changes in water and land systems that impact humans and the environment.

2.L2U1.7 Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.

2.L2U1.9 Obtain, analyze, and communicate evidence that organisms need a source of energy, air, water, and certain temperature conditions to survive.

Arizona Social Science Standards

GEOGRAPHY

Human-environment interactions are essential aspects of human life in all societies.

2.G2.1 Explain how weather, climate, and other environmental characteristics affect people's lives in a place or region being studied

2.G2.2 Describe how human activities affect the communities and the environment of places or regions.

CIVICS

Citizens have individual rights, roles, and responsibilities

2.C2.2 Explain how all people, not just official leaders, play important roles in the world.

Process, rules, and laws direct how individuals are governed and how society addresses problems.

2.C4.1 Explain how people work together to identify and solve problems within our world.

Pesky Pollution- Causes, Types, and Solutions

SIOP Elements		
Preparation Adapting content Linking to background Linking to past learning Strategies used	Scaffolding Modeling Guided practice Independent practice Comprehensible input	Grouping Option Whole class Small groups Partners Independent
Integrating Processes Reading Writing Speaking Listening	Application Hands on Meaningful Linked to objectives Promotes engagement	Assessment Individual Group Written Oral

Arizona English Language Proficiency Standards

Grade 2-3

Basic

Listening and Reading

Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.

B-1: ask and answer questions by using evidence from a text.

B-2: recount specific details and information in a variety of texts.

B-1: determine the meaning of frequently occurring academic and content-specific words and phrases.

Speaking and Writing

Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-3: use grade appropriate words and phrases, including frequently occurring adjectives and adverbs.

Standard 4 By the end of each language proficiency level, an English learner can construct grade appropriate oral and written claims and support them with reasoning and evidence.

B-2: supply a reason that supports the opinion and is based on some textual evidence.

Overview

Pollution is a major problem in our modern world. Students need to know the causes of pollution in order to create solutions to save their communities.

Purpose

In this lesson students will learn about several types of pollution (water and acid rain) and their causes. Students will then determine how they can prevent or lessen the amount of pollution.

Key Vocabulary

affect- have an effect on; make a difference to

natural pollution – a pollutant created in nature such as volcanic dust, algae blooms, animal waste, or dirt

human pollution- pollutants created by human activities such as littering, driving cars, operating factories, and dumping chemicals

effect - the result of an action

environment - the water, soil, land, and air that affect living things

Materials

- Vocabulary Practice Worksheet
- Vocabulary Cards
- Projection device
- Pesky Pollution PowerPoint
- YouTube Video What is Acid Rain? (1.58 min)
<https://www.youtube.com/watch?v=1PDjVDlrFec>

Pesky Pollution- Causes, Types, and Solutions

- One copy of *Oil Spill!* By: Melvin Berger
- YouTube Video: Oil Spill (7.40 min)
<https://www.youtube.com/watch?v=M2FwiDINAUQ>
- Is It Natural Pollution or Human Pollution? PowerPoint
- Quiz worksheet-draw a line
- PowerPoint Quiz (circle the answer)
- Activity Supplies (enough for groups of 4)
 - Tin pans
 - Water bottles with caps
 - Vegetable oil in small container with a lid
 - Cotton balls
 - Paper towels
 - One bottle of Dawn dish soap
 - Medicine dropper
 - Spoons
 - Feathers (optional) but good for simulating animal fur/feathers that are oil soaked
- Our Plan to Clean Up an Oil Spill
- YouTube Video: Dawn Saves Wildlife (Duck, Duck Oil) (2.54 min)
<https://www.youtube.com/watch?v=A0XvAdwFW8Q>
- Rubric for Participation in Oil Spill Activity
- Vocabulary Test and Answer Key

Objectives

The student will be able to:

1. Identify the cause of a pollutant as human or natural.
2. Analyze the impact of pollution on the environment.
3. Work in a group to determine ways to solve a problem of pollution.

Procedures

Prerequisite Knowledge: Students have discussed how water is used in their homes and daily lives. Students know what pollution is. Students have knowledge of the water cycle.

SESSION ONE

1. Begin the lesson by asking the students how they use water in their daily lives. Then ask in what other ways can humans use water (farming, factories, transportation, offices, making electricity, recreation, etc.).
(Preparation: Linking to past learning)
2. Distribute the Vocabulary Practice worksheet. Project the Vocabulary Cards and explain the words and their definitions. Add the cards to the

Word Wall. **(Scaffolding: Comprehensible input)**

3. Explain that for the next couple of days they will be learning about pollution: its types and causes.

SESSION TWO

Note: The Pesky Pollution PowerPoint has slides that call for students to be interactive in the form of a quiz. The quiz material can be done by having students use a computer program such as Peardeck or holding up white boards with their answers.

1. Project the Pesky Pollution PowerPoint. Review Session One information with slides 2-4. Introduce the new information with slides 5-21.
2. At slide 16, show the YouTube Video What is Acid Rain? (1.58 min)
<https://www.youtube.com/watch?v=1PDjVDlrFec>
3. At slide 17, show the YouTube Video: Oil Spill (7.40 min)
<https://www.youtube.com/watch?v=M2FwiDINAUQ> Ask the book is being read, ask these guiding questions:
 - a. How do oil spills occur?
 - b. Why are they dangerous?
 - c. How do oil spills affect animals?
 - d. Are oil spills natural or human pollution?

(Integrated Processes: Reading, Listening, Speaking, and Writing)

4. Conclude the session with the Is It Natural Pollution or Human Pollution? PowerPoint and have students (individually or as partners) use a 1) computer program such as Peardeck to answer the questions or 2) distribute the Quiz worksheet and have students draw a line to identify the correct illustration of the cause of the pollution (human or natural) or 3) have students identify the cause of the pollution (human or natural) by circling the right answer.

(Application: Promotes engagement, Assessment: Written, Individual or Group)

SESSION THREE and FOUR

Note: This oil spill activity might get a bit messy. You may want to take the activity outdoors or to the cafeteria.

1. Ask the questions: What are oil spills and what is the best way to clean them up? Solicit student responses. **(Preparation: Linking to past learning)**
2. Now explain that because we care about our environment and those that live in the environment, we are going to clean up an oil spill made by humans. Show the supplies that

Pesky Pollution- Causes, Types, and Solutions

each group will receive. Tell them these are the only things they can use in the oil spill activity. Leave the items on display so groups can see the supplies they may use.

3. Divide students into groups of four. Distribute 1 Our Plan to Clean Up an Oil Spill worksheet to each group. Have the groups cooperatively work to write out their plan to clean up the oil spill. **(Integrated Processes: Writing, Grouping Option: Small groups)**
4. When a group's plan has been submitted and approved, give the group a set of the supplies. Instruct them to pour the water into the pan and add the oil. Re-affirm they should follow their clean up plan. **(Application: Hands on, Promotes engagement)**
5. Have students return the activity supplies to a central location and work as a group to reflect on their plan and their success by answering the last question on the worksheet. Collect the worksheets. If time remains, have some groups share their experiences. **(Assessment: Written, Group)**
6. End the class by asking how many groups used the Dawn dish soap. What was the result of using the dish soap? Show the YouTube Video: Dawn Saves Wildlife (Duck, Duck Oil) (2.54 min)
<https://www.youtube.com/watch?v=A0XvAdwFW8Q> **(Scaffolding: Comprehensible input)**

SESSION FIVE

1. Have students construct an argument on how humans affect the environment with a focus on oil spills. Guide them through these key points: Humans probably cause the oil spill (like the Exxon Valdez). Then the water becomes polluted by oil. This hurts the animals nearby like the fish and birds. But humans who caused the pollution can help solve the problem with their clean-up efforts and try to prevent future incidents. **(Assessment: Written, Individual or Group)**
2. Give the Vocabulary Test to measure language acquisition. **(Assessment: Written, Individual)**

Assessment

Social Studies, ELA, and Science

The written argument can be graded using the 6 Traits Writing Rubric in the area of Content and Ideas. Mastery will be considered a score of 4 points or higher on the rubric.

The Our Plan to Clean Up an Oil Spill worksheet can be peer graded. Mastery will be considered a score of 6 or higher if the 9 points possible.

The Quiz over the Is It Natural Pollution or Human Pollution? PowerPoint can be graded for correct answers. Mastery will be a score of 80% or higher on the quiz (which ever version is taken).

The Vocabulary Practice can be graded for completeness and appropriate illustrations. Mastery will be considered 4 of the 5 entries done correctly.

The Vocabulary Test can be given to measure language acquisition. Mastery will be considered a score of 80% or higher.

Extensions

Students could create a diagram of how the different kinds of pollution can affect their homes/local environment.

Students could create a photo journal depicting the pollution they see on their way to school or near their homes. Then they can email the photo journal to the mayor or a city council member asking for help in solving the problem. The same assignment could apply to the school buildings and grounds.

Sources

Oil Spill! By Melvin Berger (Let's Read and Find Out Science) ISBN-13: 978-0064451215 \$5.99 on Amazon