

Garbage Island

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Grade Level	5
Duration	4-5 class periods

National Standards
GEOGRAPHY Essential Element: Environment and Society 14. How human actions modify the physical environment

AZ Standards
ELA Reading Key Ideas and Details: RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text. Integration of Knowledge and Ideas: RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
SCIENCE Life Science Standards 5.L3U1.10 Construct an explanation based on evidence that the changes in an environment can affect the development of the traits in a population of organisms. 5.L4U3.11 Obtain, evaluate, and communicate evidence about how natural and human-caused changes to habitats or climate can impact populations.

Arizona Social Science Standards
GEOGRAPHY Human-environment interactions are essential aspects of human life in all societies. 5.G2.1 Describe how natural and human-caused changes to habitats or climate can impact our world. Global interconnections and spatial patterns are a necessary part of geographic reasoning. 5.G4.1 Describe how economic activities, natural phenomena, and human-made events in one place or region are impacted by interactions with nearby and distant places or regions.

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

Stage III

Reading

Standard 4: The student will analyze text for expression, enjoyment, and response to other related content areas. The student will demonstrate knowledge of reading comprehension by:

B-6: making connections to text (i.e., text-to-text and text-to-self).

B-12: identifying the cause and effect relationship of two related events in a literary selection.

B-20: applying understanding of content vocabulary within math, science and social studies texts.

Overview

With this lesson, students will become aware of the garbage patch located in the Pacific Ocean, identify the animals affected and create solutions to the current problem. Students should become aware of the cause and effect relationship between human behavior and earth/life conservation. Students in our evolving world should become advocates and changemakers in regards to current and future world issues.

Purpose

In this lesson students will learn about the harmful impacts of human actions and will give students the opportunity to use their creativity to find a solution to a current issue.

Key Vocabulary

accumulate: to gather or collect

biodegradable: able to decompose naturally

debris: remains of something broken or destroyed; waste, or garbage

plankton: microscopic aquatic organisms

food chain: group of organisms linked in order of the food they eat, from producers to consumers, and from prey, predators, scavengers, and decomposers

ghost fishing: continued trapping and killing of marine life by a discarded fishing nets floating at sea

Materials

- LCD projector and computer
- Internet
- Garbage Patch video
- Garbage Island KWL graphic organizer

- Garbage Island materials such as tissue paper, plastic bags, bottle caps, wrapping paper, cardboard, etc.
- One tub with water for each group
- Garbage Island Model Observations worksheet
- Garbage Island Model Reflection Questions
- World map
http://geoalliance.asu.edu/sites/default/files/maps/World-pa_0.pdf
- Reading passages
- Problem and Solution Graphic Organizer
- Peer Evaluation Presentation Rubric
- Vocabulary Cards
- Vocabulary Test and Answer Key

Objectives

The student will be able to:

1. Identify the problem of plastic in the ocean.
2. Locate the garbage islands on the world map.
3. Identify relationships/interactions between two events or ideas.
4. Explain the relationships/interactions between two events or ideas.
5. Orally present to their groups their information about plastic in the ocean.
6. Propose a credible solution to address a human, animal or habitat need.

Procedures

Prior to the Lesson: Students should be exposed to content vocabulary before the lesson. Vocabulary cards may be printed and studied before beginning. Students should also have experience identifying oceans and continents on a map.

Teacher should gather lots of plastic, cardboard, paper, tissue and other items for students to float in water and see what happens.

SESSION ONE

Garbage Island

Engage:

1. Ask students, "What comes to mind when you think about a garbage island?" (**Preparation: Linking to past learning**) Have students think-pair-share to share their thoughts with a partner. (**Grouping Option: Partners**)
2. Divide students into small groups (3-4 students). Distribute the Garbage Island KWL graphic organizer and have students complete the "K" and "W" columns on their knowledge of the garbage patch using words or pictures. (**Preparation: Adapting content, Grouping Option: Small groups**)
3. As students share their ideas, create a web on the whiteboard.
4. Next, inform the groups that they will create a representation of a garbage island using the materials provided. Distribute materials (cardboard, tissue paper, etc) to each table and a tub of water. Have students create their "islands" in the water and record their observations on Garbage Island Model Observation worksheet. (**Application: Hands on, Promotes engagement, Scaffolding: Comprehensible input**) Before storing the tubs and garbage islands in a place in the classroom, have groups label their tub so they know which tub was theirs.
5. Have students complete questions 1 and 2 on the Garbage Island Model Reflection Questions. (**Application: Hands on, Promotes engagement, Scaffolding: Comprehensible input**)

SESSION TWO

Explore:

1. Play the "Garbage Patch" videos
<https://www.schooltube.com/video/945c3a7d2010a9c05ff4/GMA%20-%20The%20Great%20Pacific%20Garbage%20Patch>
<https://marinedebris.noaa.gov/videos/trash-talk-what-great-pacific-garbage-patch-0>
Have students record on their KWL chart the new information learned in the video in the "L" column or something they want more information about in the "W" column. Give each group time to share with their group members what they learned from the video. (**Preparation: Linking to Background, Integrating Processes: Listening**)
2. Ask each group to create a list of at least 3 negative impacts the garbage island may have on the world. Groups will select a partner to share their ideas to the whole class.

3. Create a concept map or word cloud to list ideas shared by groups. (**Integrating Processes: Speaking, Listening,)**
3. Distribute World Map from Arizona Geographic Alliance
http://geoalliance.asu.edu/sites/default/files/maps/World-pa_0.pdf
4. Project the map found at http://www.bluebird-electric.net/oceanography/Ocean_Plastic_International_Rescue/SeaNet_Ocean_Pollution_Clean_Up_Robotic_Fleet_System.htm Have students draw in the 6 small ocean gyres and the large one called the Great Pacific Garbage Patch. (**Application: Hands on, Promotes engagement, Scaffolding: Comprehensible input**)
5. Have students complete question 3 on the Garbage Island Model Reflection Questions. (**Application: Linked to objectives**)

SESSIONS THREE and FOUR

To access the Newsela articles, you will need to create an account. <https://newsela.com/>

Explain:

1. Let groups know that over the next couple days they will be investigating and gathering information about problem of plastic in the ocean and how this trash negatively impacts a specific animal or habitat (ecosystem).
2. Assign the following reading passages to be read on electronic devices or printed for each group.

Reading Passages:

<https://newsela.com/read/elem-great-pacific-garbage-ocean-patch/id/41751/>

<https://newsela.com/read/elem-plastics-reach-deep-sea/id/37883>

<https://newsela.com/read/plastic-turtles/id/12011/>

<https://newsela.com/read/microplastics-expedition/id/21863/>

<https://newsela.com/read/fish-eating-plastic/id/34129/>

3. Allow additional time to use ipads or other personal devices or go to the computer lab or library for research. Each group will identify at least one problem and potential solution by the end of the research session(s) and add to their KWL chart.

Elaborate:

1. Inform groups that they will now elaborate on their findings to create a solution for the problem

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that their specific animal or habitat is facing. Distribute the Problem and Solution Graphic Organizer.

2. Model how to fill out the organizer. (**Scaffolding: Modeling**)
3. Explain to the groups that they are to creatively express their solution through written or visual representations. (**Application: Hands on, Promotes engagement**)
4. Distribute the Peer Evaluation Presentation Rubric to the students and explain the criteria to guide their group's creation of a solution and plan for how they will present their findings to the class (PowerPoint, brochure, tri-fold poster, model, play/skit, or essay).

SESSION FIVE

1. Each group will present their findings to the class. The listening groups will score their Peer Evaluation Presentation Rubrics as a group presents. Each group will respond to the presentation by sharing one thing they liked about the group's solution and one suggestion of how to change the solution to be an even better solution. (**Assessment: Group, Oral**)
2. Students will take the Vocabulary Test. (**Assessment: Individual, Written**)

Assessment

Geography

The map work locating ocean gyres can be graded. Students will score 90% or higher to be considered mastery.

ELA, Science, and Geography

The KWL chart can be graded. Mastery will be considered having least 3 items on the W and L portions of the KWL chart.

The Vocabulary Test can be graded. Students will score 80% or higher to be considered mastery.

The Presentations can be graded. Mastery will be considered an average of 3 or higher on the Peer Evaluation Presentation Rubric in each category.

The Garbage Island Model Observation worksheet can be graded. Mastery will be considered completing 90% of the worksheet accurately.

The Garbage Island Model Reflection Questions can be graded. Logical answers to all three questions will be considered mastery.

Extensions

Use Marine Debris Website (includes lesson plan ideas, list of facts and videos)

<https://marinedebris.noaa.gov/activities-and-curricula>

Propose solutions to a larger audience and/or company who can be part of the change.

Compare class solutions to solutions currently being tested.

Mathematically calculate the amount of the garbage, and create a line graph that will estimate the amount of years it would take in order to fill the planet with trash at the current rate.

Sources

World Map from Arizona Geographic Alliance

http://geoalliance.asu.edu/sites/default/files/maps/Wworld-pa_0.pdf

National Geographic-Pacific Garbage Patch Vocabulary

<https://www.nationalgeographic.org/encyclopedia/gr-eat-pacific-garbage-patch/>

Garbage Patch Videos:

<https://www.schooltube.com/video/945c3a7d2010a9c05ff4/GMA%20-%20The%20Great%20Pacific%20Garbage%20Patch>

<https://youtu.be/7c9mSVPXYxU>

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