

Resource Utilization: At What Cost!

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Grade Level	High School
Duration	3 class periods

National Standards

GEOGRAPHY

Element 5: Environment and Society

14. How human actions modify the physical environment

Element 6: The Uses of Geography

17. How to apply geography to interpret the past

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

California Science Standards and Concepts for Environmental Science

Concept 10.1 - A Forest ecosystem provide ecosystem services far greater in economic value than the value of wood and other raw materials they provide.

Concept 12.3- Future food production may be limited by soil erosion and degradation desertification irrigation of water shortage, air and water pollution, climate change, and loss of biodiversity.

AZ Standards

ELA

Writing

Text Types and Purposes

9-10.W.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence.

b. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns.

c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

e. Provide a concluding statement or section that follows from and supports the argument presented.

SCIENCE

Earth and Space

HS+E.E1U3.9 Construct an explanation, based on evidence, for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

Core Ideas for Using Science

U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new

Arizona Social Science Standards

GEOGRAPHY

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

HS.G2.1 Analyze interactions within and between human and physical systems.

HS.G2.2 Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

HS.G2.4 Evaluate the use and sustainability of natural resources

Resource Utilization: At What Cost?

evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.

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 9-12

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: determine the central idea or theme and explain how they are supported by using text evidence.

B-2: recount a text including specific details and information.

B-5: utilize visual information to understand the text.

Standard 2 By the end of each language proficiency level, an English learner can determine the meaning of words and phrases in oral presentations and literary and informational text.

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

Speaking and Writing

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-1: construct a claim about a topic or text.

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

B-3 use grade appropriate words and phrases.

Listening, Speaking, Reading, and Writing

Standard 6 By the end of each language proficiency level, an English learner can participate in grade-appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.

B-1: participate in discussions about familiar topics and texts.

B-2: participate in written exchanges about familiar topics and texts.

B-5: contribute relevant information and evidence to collaborative oral and written discussions.

Overview

Utilizing our natural resources, in such a way as to sustain the planet and its plants and animals, is an

important life lesson. Students need to realize advantages and disadvantages of using natural resources in terms of overall planetary health.

Resource Utilization: At What Cost?

Purpose

In this lesson students will learn that humans can beneficially or negatively impact the environment and its ecosystems through their use of natural resources.

Key Vocabulary

slash and burn - an area of vegetation that is cut down and burned before being planted with crops

plantation farming - a type of industrialized agriculture in which a monoculture cash crop such as bananas, coffee, or vegetables is grown and exported to developed nations

deforestation - process of cutting down trees to use the land for non-forest purposes

clear cutting - process of cutting down all the trees in an area

overgrazing - damaging of plants or land through the overuse (feeding and trampling) of livestock and the land cannot recover to full health

monoculture - practice of growing a single crop, plant, or kind of livestock

Materials

- Utilizing Resources: At What Cost? PowerPoint Session One
- Computer
- Projection device
- Graphic Organizer #1
- Resources Handout
- What Is the Tragedy of the Commons? <https://youtu.be/CxC161GvMPc> (4.57 min)
- Environmental Conservation and Preservation: Definition, Differences and Advocates” (4.12 min) <https://youtu.be/XQolmcUJdag>
- Graphic Organizer #2
- Graphic Organizer #3
- Utilizing Resources: At What Cost? PowerPoint Session Two
- Graphic Organizer #4
- Writing Prompt and Scoring Guide
- Vocabulary Cards
- Vocabulary Test and Answer Key

Objectives

The student will be able to:

1. Describe the environmental effects of using nonrenewable resources.

2. Share ideas on how they would manage and sustain forest and public lands.
3. Explain the environmental effects of industrialized food production.

Procedures

Prerequisites: Students should have been introduced to the term “sustainability” and how natural resources are just one kind of resource. Any of the student materials can be uploaded into Google Docs to have electronic versions.

SESSION ONE

ENGAGE:

1. Introduce the lesson by projecting **slide 1, 2, and 3** of the Utilizing Resources: At What Cost? PowerPoint. Discuss the definitions of a resource. Distribute the Graphic Organizer #1 and have students list the resources they use and their perceived source of the resources. **(Preparation: Linking to background; Integrating Processes: Writing)**
2. Have the students share their lists with the whole class, focusing especially on how they received these resources. Have students write down at the bottom of their graphic organizer any resources they use daily but did not originally have on their list. **(Integrating Processes: Listening, Speaking, Writing)**
3. Distribute or project the Resources Handout. Allow students to add to their own list any additional resources from the handout.

EXPLORE:

4. Project the **slide 4** and show the animated YouTube video, “*What Is the Tragedy of the Commons?*”, illustrating what happens when people share a resource. <https://youtu.be/CxC161GvMPc> (4.57 min)
5. Discuss the video with the students. Ask the students for examples that they have experienced with overuse (greed) ruining a resource once enjoyed by others. **(Preparation: Linking to background or Past learning)**
6. Project **slide 5** and show the YouTube video “*Environmental Conservation and Preservation: Definition, Differences and Advocates*” (4.12 min) <https://youtu.be/XQolmcUJdag> Discuss the two terms: Conservationist and Preservationist.
7. Distribute Graphic Organizer #2 and project **slide 6**. Have students watch the video a second time, stopping at key places to discuss the concepts and help the students develop an understanding of the two words. Have students share answers

Resource Utilization: At What Cost?

to Graphic Organizer #2 to build understanding.

(Scaffolding: Comprehensible Input)

- Distribute Graphic Organizer #3. Using what they have learned, have students use the Frayer Model graphic organizer, to define and illustrate their chosen word and answer the question, *Would you like to be a conservationist or preservationist and why?*
- Optional Activity:** Hold a class Gallery Walk to display and discuss students' Frayer Models.
(Application: Meaningful, Promotes engagement, Linked to objectives)

SESSION TWO

Note: Slides 8-13 (in the Session Two PowerPoint) have information on the slides as well as a link to a video to play.

EXPLAIN:

- Project the Utilizing Resources at What Cost! Session Two PowerPoint **slides 1-6**. Discuss as a class, the questions, given at the top of the slides?
- Distribute Graphic Organizer 4. Instruct students to take notes from the upcoming PowerPoint slides and the videos to complete Graphic Organizer #4. **(Scaffolding: Comprehensible input)**
- Project **slide 8** and play the YouTube Video Climate 101/Deforestation (2.48 min).
<https://www.youtube.com/watch?v=lc-J6hcSKa8>
- Project **slide 9** and play the YouTube Video Belize: Slash and burn farming (5.33 min).
<https://www.youtube.com/watch?v=hKj6VSZLJy8>
- Project **slide 10** and play the YouTube Video Clear Cutting Pros and Cons (3.43 min).
<https://www.youtube.com/watch?v=7eQZSSiVQkQ>
- Project **slide 11** and play the YouTube Video Overgrazing and Erosion (2.29 min).
<https://www.youtube.com/watch?v=80vPDugQf0>
- Project **slide 12** and play the YouTube Video Plantation Agriculture (4.36 min).
<https://www.youtube.com/watch?v=CCTpN1w9Ka8>
- Project **slide 13** and play the YouTube Video Monoculture Agriculture (3.01 min).
<https://www.youtube.com/watch?v=RFZ9IWTJx5M>
- Project **slide 14** and discuss soil degradation and the timeline of agricultural developments.
(Scaffolding: Comprehensible input)
- Project **slides 15-28** to review vocabulary and key concepts. End the session by projecting **slide 29** and having students share what they learned to a shoulder partner or to whole class. **(Application: Promotes engagement, Linked to objectives)**

SESSION THREE

ELABORATE:

- Provide the students with the following writing prompt and provide time to write an argument in response to the prompt: *You live in a developing country and are given some land. You need to be able to feed your family, so how are you going to go about this? What type of farming will you use? Will you grow one thing and then trade? Or will you have to clear some land for livestock or plants? Be creative but factual when writing your story. Be sure to explain why your decision on farming is the best one for your family.*
- Share the Scoring Guide so students understand how the assessment will be graded. **(Integrating Processes: Writing, Assessment: Individual, Written)**
- If time, have students share out their stories to the whole class. As a class, have students make suggestions to each of the stories. Wrap up the discussion by asking students to discuss whether their way of getting food for their family was healthy for the planet or not.

EVALUATE:

- Have students take the Vocabulary Test to assess learning of the key vocabulary. **(Assessment: Individual, Written)**

Assessment

ELA and Social Sciences

The graphic organizers can be graded for completeness and accuracy. Mastery will be considered a score of 80% or higher.

Vocabulary acquisition can be measured with the Vocabulary Test. Mastery will be considered a score of 83% or 5 out of 6 or higher on the Vocabulary Test.

The argument can be graded according to the Scoring Guide. Mastery will be considered a score of 40 points or higher.

Extensions

The lesson can be extended to include learning about mining and how it impacts ecosystems.

Sources

All PowerPoint slide images taken from Google Images

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Videos used in PowerPoints taken from YouTube.

- Deforestation
<https://youtu.be/lc-J6hcSKa8>
- Slash and Burn
<https://youtu.be/hKj6VSZLJy8>
- Clear cutting
<https://youtu.be/7eQZSSiVQkQ>
- Over Grazing
<https://youtu.be/80vPDugQf0>
- Plantation Farming
<https://youtu.be/CCTpN1w9Ka8>
- Monoculture
<https://youtu.be/RfZ9lWTJx5M>

Clip Art for Vocabulary Cards:

- <https://www.gettyimages.com/videos/slash-and-burn>
- <https://www.youtube.com/watch?v=CCTpN1w9Ka8>
- <https://www.sciencenewsforstudents.org/article/scientists-say-deforestation>
- <https://sites.google.com/a/seoulforeign.org/candace/Home/environmental-human-impact>
- <https://www.earth.com/earthpedia-articles/overgrazing/>
- <https://greentumble.com/advantages-and-disadvantages-of-monoculture-farming/>