

Saving the Saguaro and the Impact of Climate Change on Deserts

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Grade Level	6
Duration	3-4 class periods

National Standards

GEOGRAPHY

Element 2: Places and Regions

4. The physical and human characteristics of places

5. People create regions to interpret Earth's complexity

Element 3: Physical Systems

8. The characteristics and distribution of ecosystems and biomes on Earth's surface

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

Integration of Knowledge and Ideas

6.RI.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

Writing

Production and Distribution of Writing

6.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking and Listening

6.SL.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, and orally) and explain how it contributes to a topic, text, or issue under study.

SCIENCE

Life Science

6.L2U3.12 **Engage in argument from evidence** to support a claim about the factors that cause species to change and how humans can impact those factors.

Arizona Social Science Standards

GEOGRAPHY

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

6.G3.1 Analyze how cultural and environmental characteristics affect the distribution and movement of people, goods, and ideas.

6.G3.2 Analyze the influence of location, use of natural resources, catastrophic environmental events, and technological developments on human settlement and migration.

Global interconnections and spatial patterns are a necessary part of geographic reasoning.

6.G4.1 Explain why environmental characteristics vary among different world regions. Key concepts include but are not limited to latitude, elevation, landforms, location, and human factors

6.G4.2 Describe how natural and human-made catastrophic events and economic activities in one place affect people living in nearby and distant places.

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

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Arizona English Language Proficiency Standards

Grade 6-8

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 some text evidence.

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

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.

B-4: provide a concluding statement to an opinion.

Listening, Speaking, Reading, and Writing

Standard 7 By the end of each language proficiency level, an English learner can conduct research and evaluate and communicate findings to answer questions or solve problems.

B-1: gather information from multiple provided resources to answer questions.

B-3: cite sources used in research.

Overview

The giant saguaro is one of the plants found exclusively in the Sonoran Desert. The saguaro can live 150-200 years if the living conditions are right. Students should know the what the impact of climate change will be on the Earth's deserts and desert plants.

Purpose

In this lesson, students will learn about the factors of climate change impacting the giant saguaro in the desert due to human activities. They will then research deserts and desert plants to see how climate change is impacting our Earth. This lesson contains adaptations for diverse learners (ELLs).

Key Vocabulary

saguaro cactus: type of plant found only in the Sonoran Desert

climate change: a pattern of global or regional changes in the weather over time

migration: movement of people or animals from one region to another

acanthochronologist: scientist who studies the saguaro

atmospheric carbon dioxide: a gas that is produced when people and animals breathe out or when certain fuels are burned and is found in Earth's atmosphere

necrosis: type of disease in cactus

Materials

- Vocabulary Cards
- Projection device
- Saguaros Taking a Tumble (7.41 min) YouTube video
<https://www.youtube.com/watch?v=u3H7fKGDw2s>
- Saving the Saguaro Crossword Puzzle and Answer Key
- Saving the Saguaro Cryptogram and Answer Key
- Beautiful Arizona: The Saguaro Cactus (3:45 min) YouTube video
<https://www.youtube.com/watch?v=NnAybpBexTs>
- Beautiful Arizona: The Saguaro Cactus note taking sheet
- Biomes and Climate Change: Desert and Semi-Arid Lands YouTube video (5.42 min)
(<https://www.youtube.com/watch?v=7JQF1VwFpzc>)
- Saving the Saguaro Research Worksheet

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- Vocabulary Test

Objectives

The student will be able to:

1. Identify how a saquaro adapts to its environment.
2. Identify characteristics of desert biomes including its plants.
3. Determine ways to lessen our impact on the desert environment.
4. Define vocabulary associated with the saquaro cactus.

Procedures

SESSION ONE

1. Begin the lesson by projecting and explaining the Vocabulary Cards. To help explain "necrosis," play a few minutes of Saguaros Taking a Tumble YouTube video (7.41 min) <https://www.youtube.com/watch?v=u3H7fKGDw2s>
2. Have students work in pairs to complete the Saving the Saguaro Crossword Puzzle and Saving the Saguaro Cryptogram to reinforce the learning of the new vocabulary. **(Scaffolding: Comprehensible input; Application: Linked to objectives)**
3. Exit Out the Door: Have students work with a different partner and share 2 of the definitions and what they mean. Have them use the words in a sentence. **(Grouping Option: Partners, Assessment: Oral)**

SESSION TWO

4. Distribute the Beautiful Arizona: The Saguaro Cactus note taking sheet. Point out the Sonoran Desert on the map and explain that one of the reasons why the saguaro is so special is that it is unique to this part of the world. Project Beautiful Arizona: The Saguaro Cactus (3:45 min) YouTube video <https://www.youtube.com/watch?v=NnAybpBexTs> and instruct students to take notes on information given about the saguaro.
5. Have students share their notes with the class and allow students to add to their note taking sheets.
6. Have students highlight the information they have written concerning how the saguaro adapts to its biome (environment).
7. Now have students think about deserts and how climate change will affect desert biomes. Project Biomes and Climate Change: Desert and Semi-Arid Lands

(<https://www.youtube.com/watch?v=7JQF1VwFpzc>) YouTube video (5.42 min) and have

students answer the question about the effect of climate change on deserts on the note taking sheet. Have students share answers and add to their note taking sheets. **(Application: Linked to objectives; Integrating Processes: Listening and Writing)**

8. Explain that this cactus in only one type of desert plant and the Sonoran Desert is only one of the world's deserts. Have students contribute the names of other types of desert plants. Have students contribute names of other deserts. Record these on the white board or with a doc camera. **(Preparation: Linking to background or past learning)**
9. Project Wikipedia List of Deserts by Area found at: https://en.wikipedia.org/wiki/List_of_deserts_by_area
10. Scroll through the list and have students pick a desert of interest to them. Explain that they will be researching that desert biome and investigating a plant living there.

SESSION THREE

11. Distribute the Saving the Saguaro Research Worksheet. Have student work in groups or individually to complete the research and following assessments. **(Grouping Option: Independent or Small groups)**
12. Instruct students to write the name of the desert they will be researching at the top of the page. As they identify their plant, they will add the plant name to the top as well.
13. Allow time for students to research their desert, their plant, and what the projected effects of climate change will be on this desert, this plant, and humans living in the area. As a class generate some ideas on solutions to climate change. **(Integrating Processes: Reading, Writing, Speaking; Grouping Option: Independent or Small groups)**

SESSION FOUR (OPTIONAL)

14. When research is completed, check students' (student groups') work before going on to the next step.
15. Have students create a PowerPoint or any other visual art form of their desert and their plant. Instruct students that the presentation must include how climate change is affecting this desert, its plants, and the humans living nearby. The presentation must also include some solutions to climate change.

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Assessment

Social Science, Science, and ELA

The Saving the Saguaro Research Worksheet can be graded for completeness and accuracy using the points given for each component. Mastery will be considered a score of 80 points or higher.

The Crossword and Cryptogram puzzles can be graded for accuracy. Mastery will be considered a score of 80% or higher.

The Vocabulary Test can be graded to measure language acquisition. Mastery will be considered a score of 80% or higher. **(Assessment: Written, Individual or Group)**

Extensions

Instead of a PowerPoint Presentation, students could create a Big Book with each page being an informative writing about the different deserts/plants

found on Earth. One page should be the Sonoran Desert and the saguaro.

The saguaro is often used as an icon for the Southwest. Have students design another icon using what they know about the Southwest and what image would best represent it. Maybe even have the class vote on the best one??

Students could look at other biomes (rainforests, forests, oceans, etc.) and complete the same sort of research.

Sources

How disease has affected cactus (Bacterium Necrosis):

<https://www.youtube.com/watch?v=69kL8pzW098>

Climate Drought in arizona affecting saguaros (<https://cronkitenews.azpbs.org/2018/12/04/arizona-saguaros-climate-and-drought/>)