# Saving the Saguaro and the Impact of Climate Change on Deserts

**Author**  
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**Grade Level**  
6

**Duration**  
3-4 class periods

### National Standards

<table>
<thead>
<tr>
<th>GEOGRAPHY</th>
<th>ELA</th>
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</table>
| Element 2: Places and Regions  
4. The physical and human characteristics of places  
5. People create regions to interpret Earth's complexity | Reading  
Integration of Knowledge and Ideas |
| Element 3: Physical Systems  
8. The characteristics and distribution of ecosystems and biomes on Earth's surface | 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. |
| Element 5: Environment and Society  
14. How human actions modify the physical environment | Writing  
Production and Distribution of Writing |
| Element 6: The Uses of Geography  
18. How to apply geography to interpret the present and plan for the future | 6.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |

### AZ Standards

<table>
<thead>
<tr>
<th>SCIENCE</th>
<th>GEOGRAPHY</th>
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| 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. | Examining human population and movement helps individuals understand past, present, and future conditions on Earth’s surface. |

### Arizona Social Science Standards

<table>
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| 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 Geographic Alliance
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 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
- Saguaro Taking a Tumble (7.41 min) YouTube video [link]
- 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 [link]
- Saving the Saguaro Research Worksheet
Saving the Saguaro and the Impact of Climate Change on Deserts

- Vocabulary Test

### Objectives

The student will be able to:

1. Identify how a saguaro 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 saguaro cactus.

### Procedures

#### SESSION ONE

1. Begin the lesson by projecting and explaining the Vocabulary Cards. To help explain “necrosis,” play a few minutes of Saguaro Taking a Tumble YouTube video (7.41 min) [https://www.youtube.com/watch?v=u3H7fKGDw2s](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](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=7JQF1VwFpzo](https://www.youtube.com/watch?v=7JQF1VwFpzo) 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)
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