

ROZZY READERS

**RESTORATION ECOLOGIST:
SAGUARO NATIONAL PARK
6-8**

Section 1: Restoration Ecologist

Restoration Ecologist



A scientist who attempts to repair a natural habitat or ecosystem that has been damaged.

National Parks



National parks are parks in the United States that have been created by the government. The government created national parks so that it could keep the plants and animals that live there safe.

Saguaro National Park



A national park that is located in the state of Arizona. The park was created to protect and display forests of the Saguaro Cactus

Career Highlight:

Restoration Ecologist

Restoration ecologists are scientists who attempt to repair ecosystems or natural habitats that have been damaged.

Restoration ecologists study damaged ecosystems to determine the cause and create a plan to restore the ecosystem and prevent future damage.

Responsibilities include:

- Find and explore ecosystems that need repair.
- Identify factors that are causing damage to ecosystems and create a plan to remove them.
- Perform experiments and conduct research to evaluate the damage.
- Create and implement a plan to restore the ecosystem to health.

Education required:

To be a restoration ecologists you typically need a bachelor's degree with a major in science such as biology, environmental science, or conservation.



Content Check:

Restoration Ecologist

Answer the questions below about restoration ecologists using complete sentences.

1. What do restoration ecologists do? .

2. What kind of education is recommended to become a restoration ecologist?

3. Would you enjoy being a restoration ecologist? Why or why not?

Section 2:

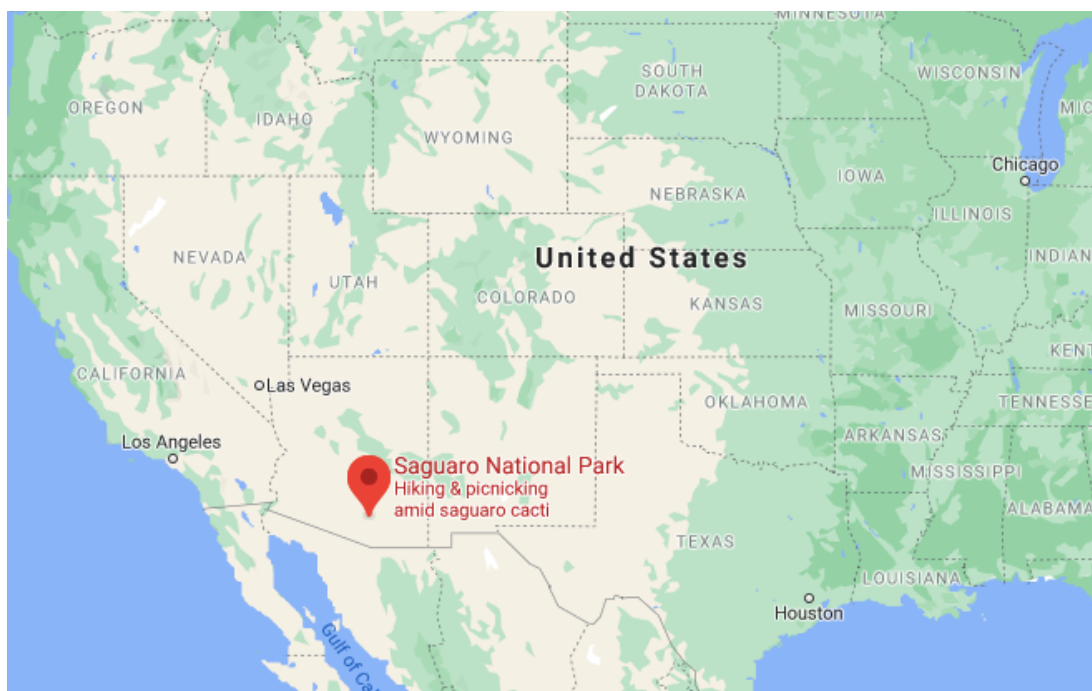
Saguaro National Park

Imagine that you just got a job as a restoration ecologist at Saguaro National Park. Learn about Saguaro National Park and the animals and plants who live there to prepare yourself for your new role!

Learn: Saguaro National Park

LOCATION:

Saguaro National Park is located in the state of Arizona. The park is made up of two different areas that are referred to as districts. There is the Rincon Mountain District and the Tucson Mountain District. The Rincon Mountain District is on the east side of the city of Tucson, while the Tucson Mountain District lies on the west side of Tucson.



QUICK FACTS:

Saguaro National Park was made a national park in 1994. The park was created to protect and display forests of the Saguaro Cactus for which the park was named. The park also protects the archeological sites located in the area.



HISTORY:

- The Hohokam are the first known people to live in the area that is now Saguaro National Park. They lived there from 200 to 1450 A.D.
- The Hohokam were farmers who also hunted and gathered foods in the Rincon and Tucson Mountains. Today, the Pima and Tohono O'odham carry on the Hohokam's desert traditions.
- Spanish explorers came to the area around 1540. Settlements were not built in the area until around 150 years later.
- The Homestead Act of 1862, the railroad being built in 1880, and Arizona becoming a part of the United States in 1912 all contributed to the development of the area.
- After the Apache Wars ended 1886, miners and ranchers came to the area. Mining of the area continued until 1942, and ranching continued until the mid-1970s.
- In 1994 Congress made the area Saguaro National Park.



Hohokam Petroglyph



Hohokam Petroglyphs

DISTRICTS:

The park is made up of two different areas that are referred to as districts known as the Rincon Mountain District and the Tucson Mountain District. The Rincon Mountain District is on the east side of the city of Tucson, while the Tucson Mountain District lies on the west side of Tucson.

The Tucson Mountain District of Saguaro National Park ranges from an elevation of 2,180 ft to 4,687 ft. It has two biotic communities: the desert scrub and desert grassland. Biotic communities are groups of organisms that live in the same ecosystem under the same environmental conditions.

The Rincon Mountain District of Saguaro National Park's elevation varies from 2,670 ft to 8,666 feet. It contains 6 biotic communities. The biotic communities present in this district are desert scrub, oak woodland, desert grassland, pine-oak woodland, pine forest and mixed conifer forest. The Rincon Mountains give this area a wider range of elevation which allows for more biotic communities.

Tucson Mountain District



Rincon Mountain District

PLANTS:

Saguaro National Park was named after the saguaro cactus. Though it is the most famous, the saguaro cactus is not the only cactus that can be found in the park. Saguaro National Park is home to 25 species of cactus!



Saguaro Cactus



Fishhook Barrel Cactus



Mammillaria

Cacti are not the only plant that can be found in this park. There are also at least 225 species of grass and many are a great source of food for wildlife. These grasses were once eaten by desert bighorn sheep, but are not eaten as much now since the desert bighorn sheep no longer lives in the area. Fluffgrass and nine-awn pappusgrass are two types of native grass.

Native grass species do not burn very hot and therefore do not cause intense fires. Nonnative grasses have caused intense fires in the park from 1989–1999.

Buffelgrass is a nonnative and invasive grass that is the biggest threat to the park. It could overtake large areas of the park and cause high-intensity fires. This would kill the protected saguaro and cause damage to the native plants and animals in the area.



Buffelgrass on Fire



Nine-Awn Pappusgrass

Saguaro National Park has over 3,500 different plant species. Of those, the majority are trees and shrubs. The mesquite, palo verde, and ironwood are a few examples of plants that are found at lower elevations.



Mesquite



Palo Verde



Ironwood

At higher elevations plants such as gambel's oak, mountain mahogany, and New Mexico locust can be seen.



Gambel's Oak



Mountain Mahogany



New Mexico locust

ANIMALS:

Animals that live in Saguaro National Park have adapted to the conditions of the desert. Some animals deal with the high temperatures and little water by being nocturnal or staying sheltered in the shade. For example, the desert pack rat builds a shelter to escape the heat and the Gila monster lives in burrows underground for the majority of the year. Other animals have special features that help them keep cool. For example, the jackrabbit's large ears are able to move heat away from their body to cool them down.



Desert Pack Rat



Gila Monster



Jackrabbit

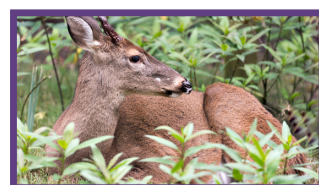
Roadrunners, horned lizards, and collared peccaries are also animals that can be found in the park. In the Rincon Mountain District you may see animals such as white-tailed deer and black bears since the higher elevation allows for colder temperatures.



Road Runners



Collared Peccary



White-Tailed Deer

VISITING TODAY

Today, people visit Saguaro National Park to view the saguaro cactus and other wildlife lives in the park. Visitors also enjoy visiting prehistoric sites, such as rock shelters and sites with rock art from long ago, to learn about the history of the park.

In addition, many visitors come to Saguaro National Park to do outdoor activities such as hiking and camping.



Content Check:

Saguaro National Park

1. Why was Saguaro made a national park?

2. Name at least two animals that can be found in Saguaro National Park and how they are able to adapt to live in the desert conditions.

3. Why are nonnative grasses, such as buffelgrass, harmful to Saguaro National Park?

Section 3:

ELA Practice

Writing Explanatory Texts

Restoration ecologists help to determine what is causing harm to an ecosystem and then create a plan in order to restore the ecosystem. Imagine that you are a restoration ecologist at Saguaro National Park who is trying to remove buffelgrass that is harming the park. You will be designing a robot that will help remove buffelgrass from Saguaro National Park without killing the other plants and animals that live there. Then, you will write an email to you supervisor explaining why the robot is important, how it looks, and how it works.

Watch the video shown by your teacher to learn more about buffelgrass before designing your robot. While you watch, think of the following:

- How will your robot know whether a plant is buffelgrass?
- How will your robot remove the buffelgrass without harming any of the native plants around it?
- How will your robot make sure that it gets all the roots so that it does not grow back?

Sketch your robot in the box below. Then, answer the questions on the next page about your robot using complete sentences.



1. How will your robot tell the difference between buffelgrass and other plants?

2. Describe how your robot is able to remove the buffelgrass without harming any of the native plants around it.

3. How will your robot make sure that it gets all the roots so that the buffelgrass does not grow back?

4. Does your robot have any cool features that will help with removing the buffelgrass?

Write an email to your boss telling them about your new robot in the purple box below! Your email must have a minimum of 7 sentences and contain the following:

- Reasoning on why it is important for the buffelgrass to be removed
- A description of how your robot looks using at least three adjectives
- A description of how your robot works using at least two adverbs
- A greeting and closing

Section 4:

Math Practice-

Finding a Fraction of a Whole Number and Converting to Percentages

Now that you have created a robot you will test how well it is able to remove the buffelgrass in Saguaro National Park.

You will calculate the percentage of buffelgrass your robot has removed from the park. Look at the example problem below. You will round your answers to the nearest hundredth.

EXAMPLE:

You set a goal for your robot to remove 147 buffelgrass plants. The robot was only able to remove $\frac{1}{3}$ of the amount you wanted. How many buffelgrass plants did it remove? What percent of your removal goal was met?

Find how many plants you removed.

$$\frac{1}{3} \text{ of } 147$$

$$\frac{1}{3} \times \frac{147}{1} = \frac{147}{3}$$

$$\frac{147}{3} = 49$$

=49 buffelgrass plants were removed
and the goal was 147

Find how much of your goal was met. Your answer should be in the form of a percent.

$$\frac{49}{147} = .3\bar{3}$$

$$.33 \times 100 = 33\%$$

=33% of your goal was met

Complete the math problem below. Show your work in the purple box and round all answers to the nearest hundredth.

1. On Monday, you set a goal for your robot to remove 645 buffelgrass plants. Your robot was only able to remove $\frac{5}{7}$ of the amount you wanted. How many buffelgrass plants did it remove? What percent of your goal was met?

Find how many plants you removed.

_____ buffelgrass plants were removed and the goal was 645.

Find how much of your goal was met. Your answer should be in the form of a percent.

= _____ of your goal was met

2. On Tuesday you set a goal for your robot to remove 68 buffelgrass plants. Your robot was only able to remove $\frac{3}{8}$ of the amount you wanted. How many buffelgrass plants did it remove? What percent of your goal was met?

Find how many plants you removed.

_____ buffelgrass plants were removed and the goal was 68.

Find how much of your goal was met. Your answer should be in the form of a percent.

= _____ of your goal was met

Complete the math problem below. Show your work in the purple box and round all answers to the nearest hundredth.

3. On Wednesday you set a goal for your robot to remove 876 buffelgrass plants. Your robot was only able to remove $\frac{3}{13}$ of the amount you wanted. How many buffelgrass plants did it remove? What percent of your goal was met?

Find how many plants you removed.

_____ buffelgrass plants were removed and the goal was 876.

Find how much of your goal was met. Your answer should be in the form of a percent.

= _____ of your goal was met