

SCIENCE·3D

DESERT BATTLE: NINJA RAT VS RATTLESNAKE

In this packet, sample student answers are provided in **red** and notes to teachers are in **blue**.

This **Explore Your Backyard** activity has students explore weather and environmental conditions and investigate how plants are adapted to the local environment. They will enhance their writing skills by comparing and contrasting their local habitat to the Sonoran Desert.



The structure of parts, from cells to body systems, is linked to their function. In the Sonoran Desert, plants and animals are adapted to be able to survive with very little water and very high temperatures. What about other environments? How do the structures and functions of plants and animals compare to those of the Sonoran Desert?

Explore the ecosystem that your teacher has assigned you. And answer the following questions.

1. Write two paragraphs to **describe** the ecosystem that is the focus of your investigation. Include the following points:
 - A. the type of ecosystem
 - B. the location of the ecosystem
 - C. the change in temperatures through the year (for example, seasonal differences)
 - D. the patterns of precipitation (the type and amount at different times of the year)
 - E. whether the soil is thick/rich in nutrients or thin/poor in nutrients
 - F. the biggest challenges to survival that plants and animals face

Complete answers will address all of the elements above. For example: I am investigating a forest ecosystem in Pennsylvania. There are four seasons. It is hot in the summer, cool in the fall, cold in the winter, and warm in the spring. In the spring it rains a lot, but it is dry with some rain in the summer and fall. In the winter it snows a lot. The soil is rich and fertile in this ecosystem.

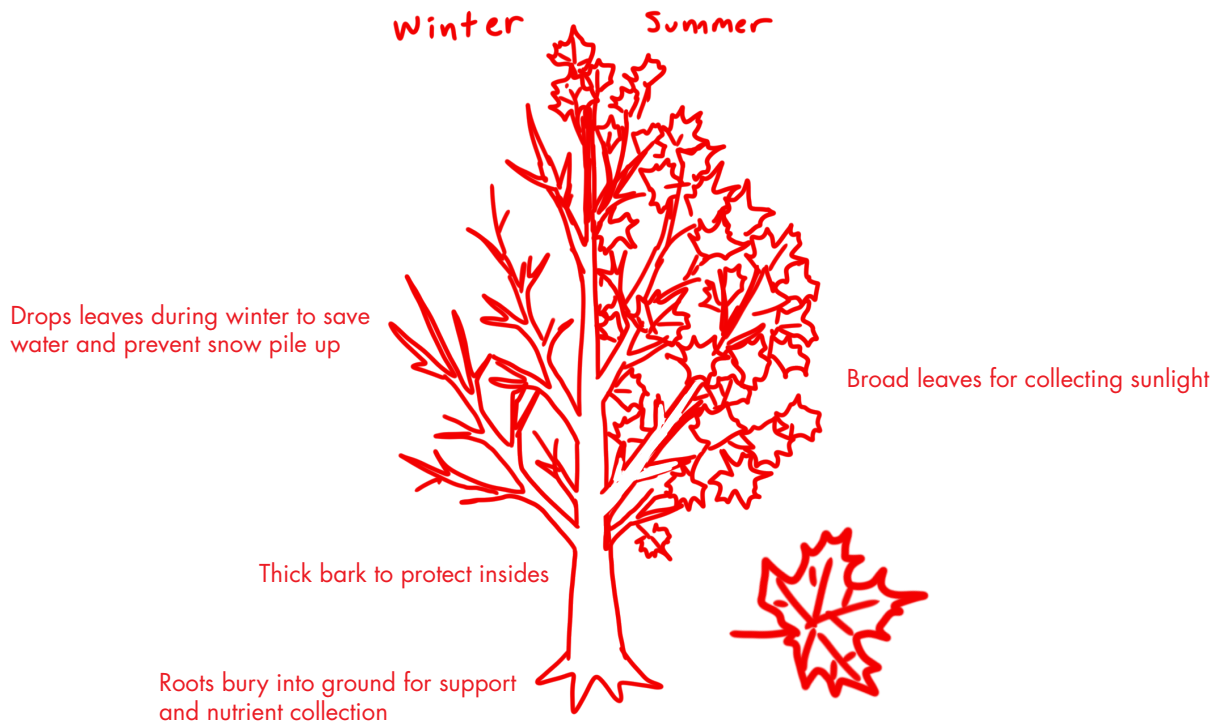
In the forest ecosystem, plants have to survive the winter when it is cold and there is not a lot of rain. Animals have to find food, avoid predators (okay if students do not include this), and stay warm in the winter.

2. Write several sentences to **compare** and **contrast** your ecosystem with the Sonoran Desert. How are the challenges plants and animals face in both ecosystems similar and different?

Complete answers will compare patterns of temperature and precipitation and compare the challenges animals and plants face in their chosen ecosystem to those of the Sonoran Desert (temperature, lack of water, predators, getting food/nutrients). For example: The Sonoran Desert has less rainfall than the forest ecosystem in Pennsylvania. The plants and animals in the forest ecosystem are equipped to survive harsh winters and heavy snow, while the plants and animals in the Sonoran Desert are not. Plants and animals in both ecosystems have to find enough resources to survive and avoid getting eaten.

3. Choose one plant in the ecosystem you are studying. **Draw** the plant in the space below. Remember to include its leaves. Next to your drawing point out key structures. List the function of each structure.

The plant I chose: Maple tree



4. **Compare** and **contrast** your plant to those of the Sonoran Desert. How are the structures you drew similar and different to the structures in desert plants?

Complete answers will compare leaf shape and size and relate that to the amount of water/temperature in the ecosystem. Students should point out that the structures have similar functions but the shapes/sizes are different. For example: Maple trees leaves are broad and flat, while cacti in the Sonoran Desert have thin, needle like leaves. Maple trees lose their leaves in the winter, while cacti do not. Cacti and maple trees are similar in that they both use chlorophyll to gather energy from the sun, but the maple tree photosynthesizes in its leaves, while the cacti photosynthesizes in its stem. Cacti and maple trees also have roots to support them in the ground and gather water and nutrients.

5. Focus on one structure from the plant you chose and **predict** what environmental features influenced its form and function.

Accept reasonable answers. For example: I predict that a maple tree drops its leaves in a cold climate to help save water in the winter and keep a lot of snow from piling up and breaking its branches.

6. Choose one animal in the ecosystem you are studying. In the space below, **draw** the animal. Next to your drawing point out key structures. List the function of each structure.

The animal I chose: Squirrel



7. **Compare** and **contrast** your animal to one that has a similar ecological role in the Sonoran Desert (for example, a predator or an herbivore). How are the structures you drew similar and different to the structures in desert animals?

Accept reasonable answers. For example: Squirrels live in tall trees and have large bushy tails and strong claws to help them navigate and balance in the treetops, while kangaroo rats live on the ground and have long legs and large feet for moving quickly in the open desert. Squirrels and kangaroo rats both have cheek pouches for storing seeds from plants, and whiskers to help them sense the environment.

8. Focus on one structure from the animal you chose and **predict** what environmental features influenced its form and function.

Accept reasonable answers. For example: The gray coat of a squirrel helps it blend into the dark background of the forest.

Extend the lesson: Have students present their work to their classmates. Have students work together to make a diorama or large poster that compares and contrasts animals and plants of their local ecosystem and those of the Sonoran Desert.