

- **Why do you think the scientists measured the distance from each seedling to other objects?** *This is an individual question. Students should be challenged to think critically about why the scientists wanted to know if seedlings were found close to other objects.*
- **Why do you think the scientists measured the distance from randomly selected points to nearby objects?** *Students should be asked to think critically about why the scientists would do this. They did this so they could determine whether the seedlings' distance to objects was by chance or whether seedlings tended to grow closer to other objects. The scientists, therefore, compared the seedlings' average distance to objects with the average distance from just any other point.*

Findings

- **Look at figure 10. You can see that more bristlecone pine trees were found growing in partly burned areas. What else does that chart tell you?** *That unburned areas had more trees than completely burned areas, and that completely burned areas had few trees growing in them.*
- **Explain the evidence for calling boulders, stones, fallen wood, and standing tree trunks nurse objects.** *Students should be able to explain that seedlings were found growing closer to these objects than if they were growing there by chance. Therefore, these objects were thought to be helpful to the establishment and growth of bristlecone pine trees. Nurses are people who often help others to regain or maintain their health.*

Discussion

- **Do you think forest managers should use fire as a tool to help save the bristlecone pine? Why or why not?** *Students should realize that fire can be used as a tool to help*

save the bristlecone pine. You may also hold a discussion about whether fire should be used as a tool to protect natural resources. (Note that forest managers purposely use fire to promote or maintain the health of forests.)

- **Name other ways that objects such as boulders, stones, fallen trees, and standing tree trunks provide benefits to the natural environment, anywhere they are found.** *These objects are habitats for insects, reptiles, amphibians, and other small animals. Tree trunks may be used by woodpeckers, owls, and other birds to find food or for nesting. As fallen wood decays, it helps to build the soil. Students may come up with other ways that these objects benefit the natural environment.*

Snake, Rattle, and Roll

Introduction

- **What are the questions the scientists wanted to answer?** *How do restoration activities affect snake populations? What are the different types of snakes in the area? What type of trap is best for capturing snakes?*
- **If there were fewer snakes in the ecosystem, what do you think would happen to the populations of vertebrates and invertebrates?** *Populations of vertebrates and invertebrates that are prey for snakes may increase if the snake population decreases since there would be fewer predators.*

Methods

- **Look at figures 7 and 8. Which trap do you think would work best for capturing snakes? Why?** *This is an individual question that should be supported with logic and reasoning. Long snakes can climb out of the pitfall traps.*
- **Why do you think scientists had a control area in every region?** *Controls are used by scientists so that they can compare*

their findings and see if the treatment is really affecting an area rather than something else that is not accounted for in the study.

Findings

- **Look at the pictures of the funnel traps and pitfall traps (figure 7 and 8). Why do you think that funnel traps captured more snakes?** *This is an individual question that should be supported with logic and reasoning.*
- **Do you think it is important for the scientists to use pitfall traps? Why or why not?** *Yes, it is important to use both types of traps because the pitfall trap did catch some snakes. Without using both types of traps fewer snakes would be captured.*

Discussion

- **Based on the scientists' findings, do you think this study should be done again at a later date? Why or why not?** *Since the scientists were concerned that the overall number of snakes captured was low and that the native habitat may not have been fully restored, it would be a good idea to try to do this study again and see what the results are at a future time.*
- **Based on the results of this study, do you think that restoration activity to reduce the chance of wildfire in the Bosque is a good thing for snakes? Why or why not?** *Students should be urged to look at the first paragraph of the "Discussion" section. It did not appear that snakes were affected positively or negatively by restoration activity. However, the scientists cautioned that the weather was dry, and that the native habitat may not have been fully restored at the time of the study. Students should realize that sometimes a question cannot be answered at the end of a study.*

Don't Judge a Soil by Its Color

Introduction

- **Explain why red soils are found either in strips or in round shapes following a wildfire.** *These are the shapes of the logs or the stumps that were burned in the wildfire. Do you think that more area is in red soils or black soils following a wildfire? Why?* *This is an individual question. Students should reason that there is far less land covered with old logs and stumps in the forest than is covered with brush and small trees. They may look at figure 1 for a clue.*
- **If nonnative invasive plants grow more rapidly than native plants, how might mycorrhizal fungi be affected?** *If invasive plants grow more rapidly, their roots may grow more rapidly as well. This would make the roots of invasive species more available to mycorrhizal fungi. The mycorrhizal fungi, therefore, may begin growing on the invasive roots to take advantage of the carbon they have to offer.*

Methods

- **Why do you think the scientists only took samples from the top 5 centimeters of soil?** *Students should be able to give an answer and back it up with logic. Although roots may go deeper than 5 centimeters, the scientists selected 5 centimeters as their limit because seedlings will usually root within the top 5 centimeters of soil.*
- **Why did the scientists wait a year to go back and identify the species of plants growing in the red and black soils?** *The scientists wanted to give the area 2 years after the wildfire to allow native or invasive species to spread into, take root, and grow in the area.*