Lesson Self-Check

CAN YOU EXPLAIN IT?

FIGURE 21: A lone seedling begins the process of colonizing a field of lava.

Volcanic eruptions play an important role in the formation of new ecosystems, but the resulting lava flows leave behind a hard rock surface that cannot support life. Nevertheless, living things will gradually begin to grow and thrive on this rock surface as it undergoes chemical and physical weathering. Over time, the bare rock will no longer be visible as it becomes covered in soil and plant life.

The Hawaiian Islands began to form more than 70 million years ago following volcanic eruptions in the middle of the Pacific Ocean. As time passed, the process of succession created unique tropical ecosystems. Succession from bare rock to highly diverse vegetation takes a great deal of time. When new eruptions occur, the process of succession begins again, and eventually a stable ecosystem returns.

Explain Refer to the notes in your Evidence Notebook and use what you learned in the lesson about succession to explain how a plant is able to grow in the middle of a lava field.

CHECKPOINTS

Check Your Understanding

1. Which of the following is a characteristic associated with an organism's niche but not with its habitat?
   - **a.** climate
   - **b.** soil quality
   - **c.** place in the food web
   - **d.** location within the ecosystem

2. Which of the following are factors in determining the stability of an ecosystem? Choose all that apply.
   - **a.** the process by which it recovers after a disturbance
   - **b.** the ability to function during a disturbance
   - **c.** whether a disturbance is natural or human-made
   - **d.** the rate of recovery after a disturbance
   - **e.** the level of biodiversity in the ecosystem

3. An epiphyte is a plant that grows on the surface of another plant, such as a tree. It gets water and nutrients from the air and its surroundings instead of from the tree. The tree is unaffected by the epiphyte's presence. What type of relationship does the epiphyte have with the tree? Explain your reasoning.

4. Whenever *Paramecium aurelia* and *Paramecium caudatum* are placed into the same culture and given a constant supply of food under constant conditions, *P. aurelia* will always outcompete *P. caudatum*, which eventually dies off. What factors prevents *P. caudatum* from surviving in this situation?

5. Ecological succession after a disturbance usually takes hundreds of years in the Pacific Northwest. However, succession after the Mount St. Helens eruption in 1980 has progressed much more rapidly, because some plants and animals were in protected areas when the hot ash and pumice fell. What conclusion can you draw about the pace of succession from this example?

6. Use the following terms to complete the statement:
   resilient, resistant
   If an ecosystem is _____, it is generally stable unless drastically changed by a disturbance. When a disturbance causes a change, the ecosystem quickly recovers when it is _____.

7. Ecosystem A and Ecosystem B have the same eight species, but Ecosystem A has a more even distribution of species than Ecosystem B. Which ecosystem is more diverse? Explain your reasoning.

8. Top predators are often keystone species in their habitat. Explain what happens to the biodiversity of an ecosystem when a top predator is deliberately removed from the ecosystem in which it lives.

MAKE YOUR OWN STUDY GUIDE

In your Evidence Notebook, design a study guide that supports the main idea from this lesson:

Within an ecosystem, organisms interact with each other and with their environment. The stability of the ecosystem is determined by its biodiversity, resilience, and resistance to change.

Remember to include the following information in your study guide:

- Use examples that model main ideas.
- Record explanations for the phenomena you investigated.
- Use evidence to support your explanations. Your support can include drawings, data, graphs, laboratory conclusions, and other evidence recorded throughout the lesson.

Consider how ecosystem interactions can be used to analyze ecosystem dynamics and predict how conservation efforts will affect the stability of these ecosystems.