

Section 3.1

How Changes Occur Naturally in Ecosystems

Check Your Understanding



Checking Concepts

1. What caused the development of two species of stickleback in the same lake?
2. What is the role of a pioneer species in an ecosystem?
3. Why are lichens considered to be pioneer species?
4. How is new soil created in primary succession?
5. Put the following stages of primary succession in order.
 - (a) Animals move in after the plants they require for survival have become established.
 - (b) New species of plants become established after pioneer species have altered the abiotic conditions.
 - (c) A community with a wide variety of species and more complex food webs develops.
 - (d) Pioneer species become established in an area.
6. Will primary succession or secondary succession occur after the event shown in the photograph below (volcanic lava flow)? Explain how you know.



7. The mountain pine beetle has devastated British Columbia's lodgepole pine forests.
- (a) How do lodgepole pine trees naturally defend themselves against the beetle?

 - (b) Explain why the mountain pine beetle has had such a devastating impact on lodgepole pine forests.
8. Are there more types of species in a mature forest or in a forest undergoing succession? Explain.

Understanding Key Ideas

9. How do the Galapagos finches illustrate both natural selection and adaptive radiation?
10. In a flowchart, show succession from bare rock to coniferous forest.
11. State how primary succession compares to secondary succession in terms of the following.
- (a) the amount of soil available

 - (b) the amount of nutrients available

 - (c) the rate of succession
12. Does secondary succession directly follow primary succession? Explain.

13. In the three boxes below, sketch what might happen over time if the grass on a soccer field were not cut.

Today	In 10 years	In 20 years

14. Use three different examples to explain how natural events affect ecosystems.

Pause and Reflect

Climate change is a natural event, but it is happening more rapidly because of human activities. Scientists are concerned that the current rate of climate change is harmful to ecosystems and is threatening biodiversity. Explain why scientists are concerned.