

Comprehension
PCBs and the orca
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1. PCBs are synthetic chemicals. Their full chemical name is polychlorinated biphenyl.
2. PCBs were used for industrial products, such as heat exchange fluids, paints, plastics, and lubricants for electrical transformers.
3. PCBs stay in the environment for a long time. Aquatic ecosystems and species that feed on aquatic organisms are especially sensitive to the effects of PCBs. PCBs bioaccumulate and biomagnify and also have a long half-life.
4. PCBs become concentrated in the orca's blubber.
5. When salmon stocks are low, the orca's blubber is burned for energy. The PCBs are released into the orca's bloodstream and interfere with its immune system making it more susceptible to disease.
6. Diagram should be similar to Fig. 2.55 on page 95 of the student textbook. The pyramid should include the food chain for orcas and demonstrate the total PCB load that the orca is exposed to.

Assessment
Effects of bioaccumulation on ecosystems
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1. F 2. D 3. E 4. B 5. C 6. A 7. C 8. D 9. B 10. C 11. A 12. D

Chapter 3 Ecosystems continually change over time.

Section 3.1 How Changes Occur Naturally in Ecosystems

Cloze Activity
Change in ecosystems
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1. natural selection
2. adaptive radiation
3. ecological succession
4. primary succession
5. pioneer species
6. climax community
7. secondary succession
8. flooding
9. tsunami
10. drought
11. insect infestations

Analyzing Information
Primary and secondary succession
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1. Answer should include the following sequence:
 - Lichens begin to grow. This begins the process of soil formation.
 - Plants, such as mosses, begin to grow.
 - Insects, micro-organisms, and other organisms move in.
 - Grasses, wildflowers, and shrubs begin to grow. More insects and micro-organisms move in.
 - Tree seeds are transported by animals. Deciduous trees grow.
 - Coniferous trees germinate.
 - Mature community develops.
2. Answer should include the following sequence:
 - Exposed soil will contain micro-organisms, worms, and insects as well as the seeds of wildflowers, weeds, grasses, and trees.
 - Other seeds may blow in or be carried in by animals.
 - Deciduous trees grow.
 - Coniferous trees return.
 - Mature community may only take decades to establish.

Applying Knowledge
How natural events affect ecosystems
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NATURAL EVENT	EFFECTS ON MATURE COMMUNITY
Fire	<ul style="list-style-type: none"> • causes secondary succession • results in regrowth
Flooding	<ul style="list-style-type: none"> • causes soil erosion • results in soil and water pollution, leading to widespread disease
Tsunami	<ul style="list-style-type: none"> • water carries away or destroys plants and animals • disrupts habitats and food webs • salt from salt water changes composition of soil
Drought	<ul style="list-style-type: none"> • destroys habitats • results in the death of plants and animals • leads to crop failures and livestock deaths
Insect Infestation	<ul style="list-style-type: none"> • results in losses to forest canopy • disrupts habitats and food webs

Assessment
How changes occur naturally in ecosystems
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1. B 2. A 3. D 4. E 5. C 6. C 7. D 8. C 9. B