

Checkups and follow-ups

CHAPTER 10

EST
Questions 1–26 and A–C

Ecosystems

Checkup

1 WHAT IS AN ECOSYSTEM? (pp. 318–326)

3. What is the name of the feeding relationships between the living organisms of an ecosystem?

4. A carnivore cannot be a primary consumer in a food chain. Explain your answer.

5. Which trophic level do detritivores belong to? Explain your answer.

7. Explain the role of decomposers in the material flow of an ecosystem.

8. What is the main source of energy in an ecosystem?

11. Build a food chain based on the photos below.

a) Draw the food chain.

b) Specify the trophic level for each of the living organisms in your food chain.



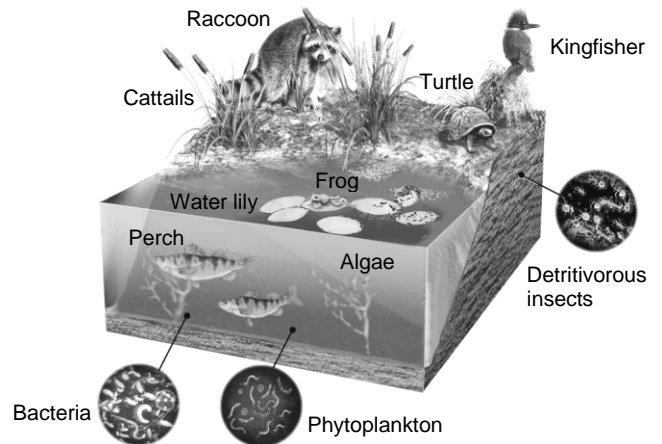
12. Look at the illustration opposite.

a) Among the organisms in the illustration, name those that are:

– producers

– consumers

– decomposers



b) Draw a possible food chain containing the organisms in the illustration.

13. If you tried to establish the feeding relationships between all the organisms of the lake ecosystem illustrated in question 12, would you be drawing a food chain or a trophic network? Explain your answer.

Name: _____ Group: _____ Date: _____

16. What does the expression *ecological footprint* mean?

17. Which of the following statements about ecological footprints is correct according to the 2003 study by the World Wildlife Fund?

- a) The ecological footprint of North Americans does not exceed the Earth's carrying capacity.
- b) If all the people in the world had the same rate of consumption as the Japanese, we would need about 2.5 planets the size of the Earth to satisfy our needs.
- c) On average, the global human ecological footprint does not exceed the Earth's carrying capacity.

3 ECOTOXICOLOGY (pp. 331–336)

18. What is a contaminant?

19. What can make a contaminant toxic? Name at least two factors.

20. What is the toxicity threshold of a contaminant?

21. What does the LD₅₀ of a contaminant indicate?

22. What is bioaccumulation?

23. Certain factories in Québec sometimes discharge low concentrations of contaminants into the environment. Explain why even small amounts of contaminants can nonetheless be hazardous to humans or other organisms at the top of food chains.

4 BIOTECHNOLOGY TO THE RESCUE (pp. 337–341)

24. Which environmental biotechnology do the following statements describe? Is it bioremediation, phytoremediation or wastewater treatment?

a) a biotechnology for cleaning the water we have used before returning it to the environment

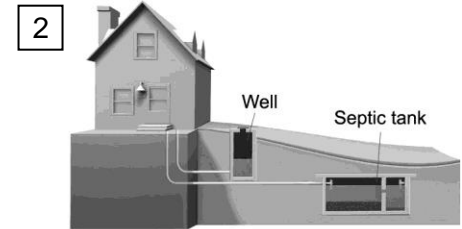
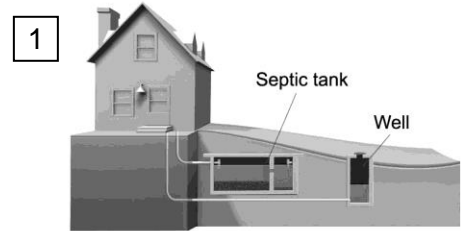
b) a biotechnology that involves a septic tank

c) a biotechnology for cleaning up a polluted site, using microorganisms that degrade contaminants

d) a biotechnology that uses plants or algae to eliminate contaminants from a site

25. Explain why it is dangerous to eat a cabbage that has been grown in soil containing a substantial amount of heavy metals.

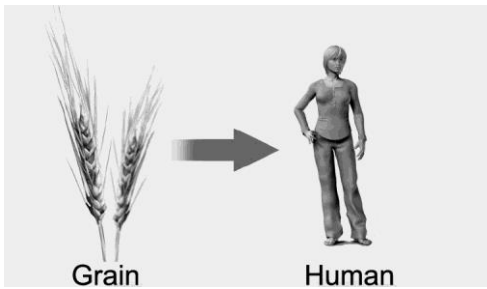
26. Look at the position of the septic tank in relation to the well in the illustrations opposite. Which installation would be preferable? Explain your answer.



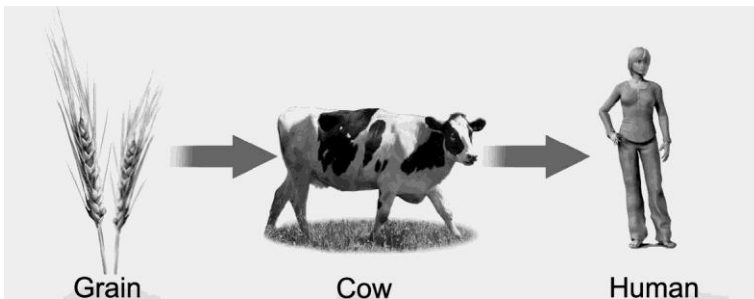
REVIEW QUESTIONS

A. Look at the following three food chains.

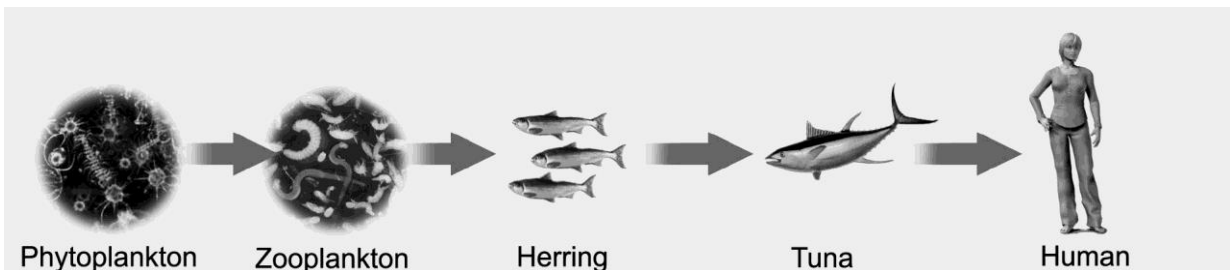
Chain 1



Chain 2



Chain 3



a) For each of the food chains, name the trophic level of the human.

b) Why is it correct to identify the phytoplankton in Chain 3 as producers?

c) Suppose that 10 percent of the available energy is converted into biomass at each change of trophic level. For each of the three food chains, calculate the percentage of the energy from the producers that the humans eventually convert into biomass.

Chain 1: _____

Chain 2: _____

Chain 3: _____

B. Suppose that a contaminant is introduced into the environments of the three food chains in question A. This contaminant can accumulate in grain and in phytoplankton. In which food chain is the human health hazard the greatest? Explain your answer.

1. Tests conducted by Health Canada show that it is now possible to swim at several beaches along the St. Lawrence River (Fleuve Saint-Laurent). However, swimming on days after a heavy rainfall is not recommended. Explain your answer.

2. What precautions must be taken by riverside residents in areas where local wastewater is discharged into septic tanks rather than to a treatment plant?
