Ecosystem Dynamics Chapter Problems

Ecology and Levels of Organization

Classwork

1. A dog and a cat are two different species. What can they not do together?
2. What is a population?
3. What are living components of an ecosystem called?
4. What are nonliving components of an ecosystem called?

Homework

5. Describe one way that you interact with your environment.
6. What is the difference between a community and an ecosystem?
7. List two examples of biotic factors.
8. List two examples of abiotic factors.

Classwork

9. What is a biome?
10. What is the biosphere?
11. List three abiotic factors that often define biomes.
12. What is the largest level of organization?

Homework

13. What abiotic factor is the most different in the desert and the tropical rain forest?
14. List one abiotic factor that coniferous forests and deciduous forests share.
15. What is an abiotic factor that is affected by geography?
16. List two differences between terrestrial and aquatic ecosystems.

Ecosystems

Classwork

17. What is a habitat?
18. What is a niche?
19. What is your habitat?
20. What is your niche?

Homework

21. In the chart below, determine whether each description is a habitat or a niche by placing an X in the appropriate box:

Description	Habitat	Niche
The Tasmanian devil is only found in Tasmania, in Australia.		
Flying squirrels are nocturnal omnivores. They live 6 years in the wild and reproduce during February and March.		
Ticks are small arachnids that survive by sucking the blood of mammals, birds, amphibians and reptiles. Ticks undergo three stages of development: larval, nymph and adult.		
Tapeworms live in the digestive tracts of vertebrates.		

Classwork

22. What three groups are present in healthy ecosystems?
23. What are producers?
24. What are decomposers?
25. What are the three different types of consumers?

Homework

26. How do producers obtain food?
27. What do primary consumers eat?
28. What type of organism is at the top of the food chain?
29. Why are decomposers important to ecosystems?

Classwork

30. What is biodiversity?
31. Is a healthy ecosystem stable or unstable?

Homework

32. How does biodiversity affect productivity?

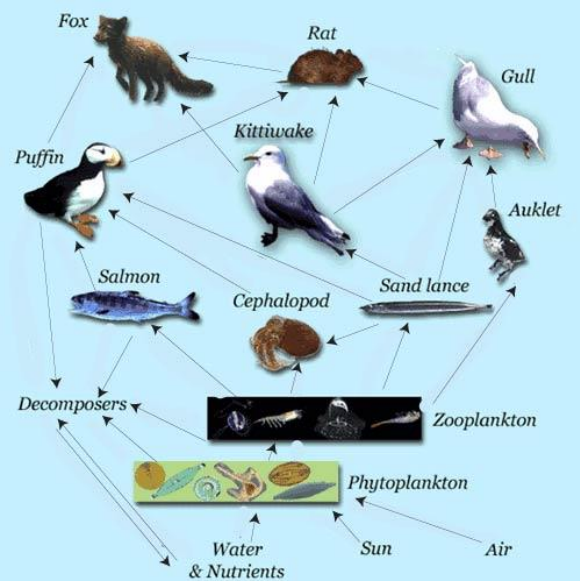
33. How does biodiversity affect stability?

Ecosystem Interactions

Classwork

34. What is a food chain?
35. What is a food web?
36. If the population of primary consumers in an ecosystem disappear, what will happen to the size of the producer populations?
37. If the population of secondary consumers in an ecosystem disappear, what will happen to the size of the producer populations?

Homework



Source: USGS

38. Which group is the producer in this food web?
39. Which group is the primary consumer?
40. If the rat goes extinct, how will this affect the kittiwake population?
41. If the puffin population grows drastically, how will this affect the zooplankton population?

Altering Ecosystems

Classwork

42. List one way that climate change can affect animals in an ecosystem?
43. List one way that climate change can affect fish?

44. How does climate change affect sea ice?
45. If climate change causes extinctions in an ecosystem, how does this affect biodiversity?

Homework

46. Polar bears hunt prey from the edges of sea ice. If global climate continues to get warmer, how will this affect polar bears?
47. How is freshwater affected by rising sea temperatures?
48. As warm water fish migrate into different areas, how does this impact local cool water fish?
49. Do ecosystems become more or less stable as climate changes?

Classwork

50. List two examples of natural disasters that could affect ecosystems.
51. List two examples of how humans have affected ecosystems.
52. How do introduced species affect local ecosystems?
53. How did the removal of the American alligator cause the decline of fish species?

Homework

54. Describe one way that a hurricane could affect an ecosystem.
55. Describe one way that urbanization could affect an ecosystem.
56. If an introduced bird species is a better competitor for food than local birds, what will happen to the local bird populations?
57. In the scenario in #56, if all the local bird species migrate to different habitats, how has the introduced species affected biodiversity?

Classwork

58. List one way that kelp forests support the ecosystem.
59. What is one result of removing sea otters from the kelp ecosystem?
60. List one way that sharks maintain a healthy ecosystem.
61. What is one result of removing sharks from the marine ecosystem?

Homework

62. List one effect of removing sea urchins from the kelp forest ecosystem.
63. When sea otters are removed from the kelp forest ecosystem, what happens to the biodiversity?
64. If sharks were to start eating healthy fish instead of weak fish, what might happen?
65. How do sharks strengthen the gene pool of fish populations?

Ecosystem Dynamics Chapter Problems Answer Key

Classwork

1. Breed
2. A population is a group of the same species living in the same area at the same time.
3. Biotic factors
4. Abiotic factors

Homework

5. Answers will vary.
6. A community is all the populations in an area. An ecosystem is all the populations as well as all the abiotic factors.
7. Answers will vary. Example: plants, animals, fungi, bacteria
8. Answers will vary. Example: sunlight, precipitation, temperature, nutrient availability

Classwork

9. A biome is a set of ecosystems with similar characteristics.
10. The biosphere is all the biomes on Earth.
11. Climate, geology, moisture, soil
12. Biosphere

Homework

13. Water
14. Answers will vary. Example: sunlight
15. Temperature
16. Answers will vary. Example: Oxygen is limiting in aquatic ecosystems, while water can be limiting in terrestrial ecosystems. Aquatic ecosystems have smaller temperature fluctuations.

Classwork

17. A habitat is the area in an ecosystem where an organism lives.
18. A niche is a description of the role an organism serves in an ecosystem.
19. Answers will vary. Example: My habitat is a 2-story house surrounded by maritime forest.
20. Answers will vary. Example: I am an omnivore who finds my food at the grocery store. I will live for about 80 years and am capable of reproducing in my early teens.

Homework

21.

Description	Habitat	Niche
The Tasmanian devil is only found in Tasmania, in Australia.	X	
Flying squirrels are nocturnal omnivores. They live 6 years in the wild and reproduce during February and March.		X
Ticks are small arachnids that survive by sucking the blood of mammals, birds, amphibians and reptiles. Ticks undergo three stages of development: larval, nymph and adult.		X
Tapeworms live in the digestive tracts of vertebrates.	X	

Classwork

22. Producers, consumers, decomposers
23. A producer makes its own food.
24. A decomposer breaks down dead organisms and recycles the nutrients into the soil.
25. Herbivores, carnivores, omnivores

Homework

26. Producers make their own food via photosynthesis (sunlight, water and CO_2).
27. Primary consumers eat producers.
28. The top of the food chain is usually quaternary consumers.
29. Decomposers are important because they recycle nutrients into the soil.

Classwork

30. Biodiversity is the variety of plants and animals in an ecosystem.
31. A healthy ecosystem is stable.

Homework

32. Biodiversity increases productivity.
33. Biodiversity increases stability.

Classwork

34. A food chain shows one pathway of interactions in an ecosystem.
35. A food web shows all interactions in an ecosystem.
36. Producer populations will increase.
37. Producer populations will decrease.

Homework

38. Phytoplankton
39. Zooplankton
40. Kittiwake populations will increase.
41. Zooplankton populations will decrease.

Classwork

42. Answers will vary. Example: Climate change can force animals to move their habitats.
43. Answers will vary. Example Climate change can force coldwater fish to lose their habitats.
44. Climate change decreases sea ice.
45. Extinctions cause a decrease in biodiversity.

Homework

46. Polar bears will have to find a new way to hunt or a new source of food.
47. Rising sea temperatures cause saltwater to mix with freshwater.
48. The habitats of cool water fish are invaded by warm water fish. They will lose their habitats.
49. Ecosystems become less stable as climate changes.

Classwork

50. Answers will vary. Example: hurricanes and volcanoes
51. Answers will vary. Example: deforestation and urbanization
52. Introduced species compete with local species for resources.
53. The removal of the American alligator caused gar populations to increase which led to a decrease in fish populations.

Homework

54. Answers will vary. Example: Hurricanes could destroy habitats for local animals.
55. Answers will vary. Example: Urbanization could cause pollution of local water supplies.
56. The local birds will have to move to a different habitat or will go extinct.
57. Biodiversity will decrease.

Classwork

58. Answers will vary. Example: Kelp forests provide shelter for fish nurseries.
59. Answers will vary. Example: Removing sea otters decreases kelp forests.
60. Answers will vary. Example: Sharks maintain healthy fish populations.
61. Answers will vary. Example: Disease would spread through fish populations.

Homework

62. Answers will vary. Example: Fish populations decrease.
63. Biodiversity decreases when sea otters are removed.
64. Answers will vary. Example: Disease would spread through the populations.
65. By only eating weak fish, only strong genes are able to be passed on to the future generations.