

# Key

## Chapter 4 Review

1. Describe 2 factors that contribute to the definition of biodiversity.

|    |  |
|----|--|
| 1. | # of individuals in 1 species in a habitat |
| 2. | # of different species in a habitat        |

2. Give 3 examples of a keystone species and explain how those species change their environments.

|    |                                      |
|----|--------------------------------------|
| 1. | otter - control urchin population    |
| 2. | wolf - control deer population       |
| 3. | sea star - control mussel population |

3. List 3 ways that prey have adapted to outwit predators and give an example of each.

|    |                |                                   |
|----|----------------|-----------------------------------|
| 1. | camouflage     | Examples: gecko/chameleons        |
| 2. | mimicry        | caterpillar that looks like snake |
| 3. | warning colors | poison dart frog                  |

4. Compare and contrast primary and secondary succession. Give 2 examples of disturbances that would cause each one to occur.

| Primary succession   | Secondary succession  |
|--|---|
| Starts w/ Rock - then lichens & mosses break down into soil. | Starts w/ disturbance But soil is present. Pioneer / fast growing plants 1st. |
| Examples:<br>Volcanoes, Glacier Retreating                   | Examples:<br>Fire, Development  |

5. What does endemic mean? only in one location

6. List and **describe** 3 species deliberately introduced and 3 species accidentally introduced.

| Deliberately introduced | Accidentally introduced |
|-------------------------|-------------------------|
| Blue Cats               | Rats                    |
| Sheep / Horses          | Fire Ants               |
| Goats / Pigs            | Zebra Mussels           |

7. List 4 characteristics of invasive species and 4 characteristic of environments susceptible to invasive species.

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| Invasive species | Environments susceptible to invasive species |
|------------------|--|
|                  |  |
|                  |  |
|                  |  |
|                  |  |

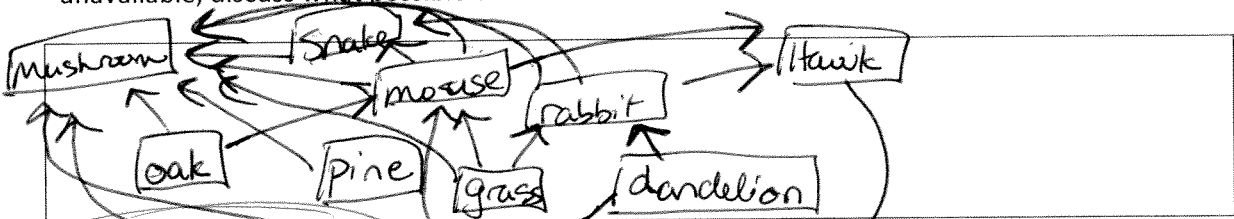
8. Explain how the flow of energy through an ecosystem follows the laws of thermodynamics.

Energy comes from Sun  
 2nd Law - Energy is always lost as move up food chain

9. Explain and describe the process by which plants synthesize their own food. What are the other products of this process?

Photosynthesis  
 $O_2 + \text{Sugar}$

10. A temperate deciduous forest contains the following organisms: oak tree, pine tree, grass, mouse, rabbit, crow, hawk, mushroom, dandelion, beetle, and snake. Construct a food web using at least five of these organisms. If one of the organisms used in your web becomes unavailable, discuss what possible effect this would have on the web.



11. How would a food web differ in a different biome? To answer this part of question 3, select a different biome and create a food web.

12. Each week, an owl must eat an average of five mice weighing 10 grams each in order to survive. How much plant material would each mouse have consumed? Solve this problem, and include set up and units. Explain how this scenario relates to trophic levels. Assume that energy and mass are proportional with the same constant of proportionality for each of these organisms.

each mouse consume 50g plant/week  
 $5 \times 10g = 50g / \text{owl}$   
 $5 \times 50 = 250g \text{ plant}$

|            |
|------------|
| 1 owl      |
| 50g mouse  |
| 250g plant |

13. Describe 2 characteristics shared by ecosystems that have high biodiversity.

↑ precipitation  
 ↑ temperatures

14. Describe 2 ecological benefits that greater biodiversity provides.

Stability of ecosystem      Health of ecosystem  
Resilience of ecosystem

15. Where is most of the worlds' biodiversity found? Equator

### Chart of Terrestrial Biome Characteristics

Use your textbook to complete the chart

The exact flora and fauna of each biome is dependent upon which continent the biome is found.

| Biome<br>list major area<br>of Earth it is<br>found                            | Precipitation   | Temperature                            | Soils<br>Describe type  | Representative<br>Flora/Adaptatio<br>ns  | Representative<br>Fauna  | Major<br>Human<br>Interferences                                |
|--|---|--|---|--|--|--|
| Temperate<br>Rainforest<br>(cloud forest)                                      | Ample<br>200-300 cm,<br>very foggy, leaf<br>drip condensing<br>on needles<br>provides much<br>precip. | Mild winter,<br>cool summers<br>8-20°C |   |  |  | Logging, dams<br>(salmon)                                      |
| Tropical<br>Rainforest   | >200 cm<br>Allows decay to<br>occur at a very<br>rapid rate   |  | Old, thin, acidic<br><u>nutrient poor</u><br>because most<br>nutrients are in<br>the biomass; soil<br>may harden to<br>concretelike<br>consistency --<br>laterite soil ( <i>rusty<br/>red color due to<br/>high<br/>concentration of<br/>iron oxides (Fe<br/>&amp; Al) from<br/>chemical<br/>weathering of<br/>underlying<br/>parent rock</i> ) | Broadleaf evergreen<br>trees; diverse<br>species throughout<br>forest; emergent<br>layer of tall trees<br>with a thick layer of<br>canopy trees below.<br>Trees may have<br>buttresses<br>(expanded bases)<br>due to massive size<br>and shallow roots;<br>epiphytes<br>(bromeliads,<br>orchids); if thick<br>canopy there is little<br>to no plant life<br>beneath. |  | Slash &<br>Burn<br>Clearcutting<br>for<br>Livestock            |
| Tropical<br>Seasonal<br>Forest (tropical<br>monsoon;<br>tropical<br>deciduous) |   |  | Higher nutrients<br>than tropical<br>rainforest, but<br>still nutrient<br>poor, acidic, and<br>highly leached   |  | Insects;<br>amphibians;<br>reptiles; Australian<br>marsupials, such as<br>koala and kangaroo | Logging,<br>agriculture,<br>invasive exotics,<br>grazing, dams |
| Temperate<br>Deciduous<br>Forest   | 75-150 cm, even<br>amounts<br>throughout all<br>seasons   | 0-20°C                                 | High nutrients<br>due to deciduous<br>trees, lots of<br>humus and leaf<br>litter  |  |  |  |
| <i>A</i> Boreal Forest<br>(taiga, northern<br>coniferous<br>forest)            |   |  |   | Low plant diversity,<br>primarily conifers<br>such as pines,<br>hemlocks, spruce,<br>cedar, fir; some<br>deciduous, like<br>maples, aspen,<br>birch; slow growing<br>season  | Wolverines,<br>moose, caribou,<br>bears, elk,<br>migratory birds                             | Logging,<br>mining, fur<br>trade, dams                         |

| Biome<br>list major area<br>of Earth it is<br>found                              | Precipitation  | Temperature  | Soils<br>Describe type  | Representative<br>Flora/Adaptations   | Representative<br>Fauna   | Major<br>Human<br>Interferences   |
|--|--|--|---|---|---|---|
| Polar<br>Grassland<br>(arctic tundra)<br><br>Alpine Tundra<br>on<br>Mountaintops | <10 cm   | -20 to 10°C,<br>Organic material<br>is slow to<br>decompose<br>because so cold,<br>short growing<br>season, low<br>biodiversity                          | <u>permafrost</u><br><br>bogs   |   |   | Too cold for<br>much human<br>activity,<br>Oil/natural gas<br>drilling and<br>associated<br>transport issues,<br>global warming |
| Temperate<br>Grassland<br><br>(In US called:<br>prairie)                         | 25-100 cm<br><br>Fire maintained                         |  | Extremely<br>nutrient rich, lots<br>of humus-<br>partially<br>decomposed<br>organic matter<br>that holds in<br>water and<br>nutrients in soil,<br>arises from<br>grasses dying<br>and decaying in<br>winter |   |   | Agriculture,<br>livestock grazing<br>if too dry for<br>crops<br><br><u>Desertification</u>                                      |
| <b>Tropical<br/>Grassland</b><br><br>(savanna)                                   | 50-150 cm<br>Prolonged dry<br>season, fire<br>maintained |  | Low in minerals,<br>easily leached,<br>may have high<br>levels of<br>Aluminum.<br>Edaphic ( <i>Living<br/>organisms are<br/>influenced<br/>mainly by the<br/>soil, not by<br/>climate</i> )                 |   | <u>Lion<br/>King</u>  | Livestock<br>grazing,<br>agriculture,<br>poaching   |
| Chaparral<br>(Mediterranean;<br>temperate<br>shrubland)<br>(steppe)              |  | 0-38°C   |   | Deep roots; thick<br>bark; Small,<br>leathery, waxy<br>leaves<br>(sclerophyllous);<br>Evergreen;<br>Allelopathy; seeds<br>require burning |   | Urbanization,<br>fires lead to<br><u>flooding</u>   |
| <u>Deserts</u>   |  | Depends on<br>location, deserts<br>usually at 30°N<br>or 30°S of<br>equator or<br>interior of<br>continents due to<br>rain shadow<br>effect<br>→ to 30°C |   |   | Usually nocturnal;<br>may aestivate<br>(hibernation when<br>hot); dry feces and<br>highly<br>concentrated urine;<br>large grazers, such<br>as gazelle, oryx;<br>United States –<br>small mammals<br>such as kangaroo<br>rats, coyotes,<br>foxes, snakes,<br>owls, hawks,<br>roadrunners | Off-road<br>vehicles,<br>Overgrazing,<br>Urbanization, oil<br>drilling, mining  |

1. All of the following illustrate the relationship of mutualism *except*

- a. lichens.
- b. epiphytes.
- c. ants and acacias.
- d. *Rhizobium* bacteria in root nodules of legumes.
- e. flowering plants and insects.

2. Which of the following would exhibit primary succession?

- a. rock exposed by a retreating glacier
- b. an abandoned farm
- c. a forest that had been clear-cut
- d. newly flooded land to create a reservoir

3. Weedy pioneer species are found primarily in

- a. early-successional stages.
- b. mid-successional stages.
- c. late-successional stages.
- d. wilderness.
- e. pre-early-successional stages.

4. Why do introduced species often become pests?

- a. They displace native species.
- b. They increase biodiversity
- c. They do not adapt well to local habitats
- d. They contribute to habitat fragmentation
- e. They have low biotic potential

5. In the field, you observe a lion chase, kill, and eat a gazelle. A vulture pecks away at the left over meat scraps. Beetles attack the remaining fragments. Finally, bacteria complete the breakdown and recycling of organic material. If you were to apply a general classification to the feeders, what would be the correct sequence?

- a. decomposer→scavenger→detritus feeder→carnivore
- b. carnivore→detritus feeder→scavenger→decomposer
- c. carnivore→scavenger→detritus feeder→decomposer
- d. carnivore→scavenger→decomposer→detritus feeder
- e. decomposer→detritus feeder→scavenger→carnivore

6. In a chaparral, you are *least* likely to find

- a. small shrubs..
- b. long, hot, dry summers.
- c. epiphytes and tall trees
- d. plants with large underground root systems.
- e. mild, slightly wet winters.

7. Permafrost is characteristic of the

- a. arctic tundra.
- b. taiga.
- c. coniferous forest.
- d. savanna.
- e. tropical savanna.

