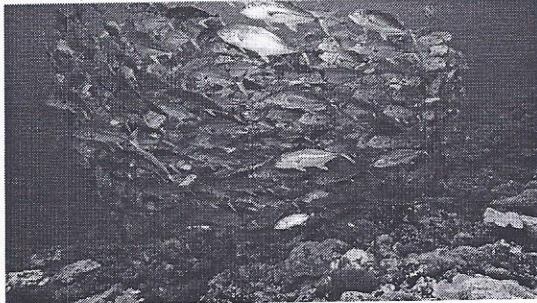


Biomes, Populations, Communities and Ecosystems Review

Multiple Choice

1. The picture below is a school (group) of Jack fish. What type of distribution does this represent?



- A) Random B) Even C) Uniform D) Clumped

2. An ecosystem is thriving because there is rain and sun on a regular basis. The grass is very green and healthy; the ponds have a good amount of clean water for the deer and chipmunks to drink. The rabbits have dug many holes in the soil for shelter and the lynx has enough prey to feed on. Which items listed are considered part of the biomass?

- A) The rain, sun, ponds and soil
 B) The grass, deer, chipmunks, rabbits and lynx
C) The deer, chipmunks, rabbits and lynx
D) The rain, sun, ponds, soil, grass, deer, chipmunks, rabbits and lynx

3. Which of the following communities has a population distribution that would allow it to sustain itself and not run out of food for one type of species?

- A) 50 bears, 60 rabbits, 58 beavers, 25 fir trees and 15 birch trees
 B) 4 bears, 30 rabbits, 7 beavers, 25 fir trees and 10 birch trees
C) 50 bears, 100 rabbits, 7 beavers, 25 fir trees and 15 birch trees
D) 25 bears, 60 rabbits, 58 beavers, 5 fir trees and 7 birch trees

4. Which answer best describes what a coral reef is?

- A) Coral reefs are non-living substances that float in the ocean
B) Coral reefs are a type of fish that live in oceans
 C) Coral reefs are organisms whose skeleton is made up of CaCO_3 and feed on algae
D) Coral reefs are a type of rock that other fish use as shelter

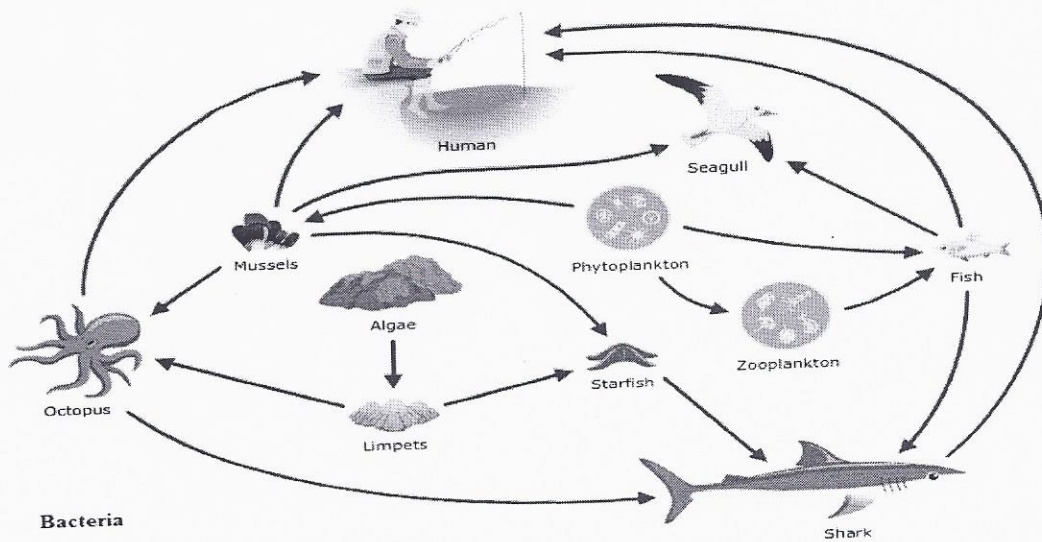
5. With which living organism is primary productivity associated?

- A) A bee B) A tree C) A cow D) An earthworm

6. If elements are to be recycled in nature, which organisms must be present?

- A) Decomposers B) Predators C) Herbivores D) Parasites

7. The following diagram shows the food web for a coastal ecosystem.



Which choice has the organisms in the correct trophic level?

	Producers	Consumers	Decomposers
<input checked="" type="radio"/> A	Algae and phytoplankton	Zooplankton, limpets, octopus, mussels, fish, shark, seagull, human and starfish	Bacteria
<input type="radio"/> B	Algae and zooplankton	Limpets, octopus, mussels, fish, shark, seagull, human, phytoplankton and starfish	Bacteria
<input type="radio"/> C	Algae	Zooplankton, limpets, octopus, mussels, fish, shark, seagull, human, phytoplankton and starfish	Bacteria
<input type="radio"/> D	Algae and phytoplankton	Zooplankton, limpets, octopus, mussels, fish, shark, seagull, human and starfish	None

8. Deer share the open plains with other grazing animals and predators. Which of the following would eventually lead to a decrease in the deer population?

- A) A reduction in the predator population
- B) An increase in the number of other grazing animals
- C) A reduction in the grazing animal population
- D) An increase in restrictions on the hunting of deer

9. Which interaction **best** illustrates the concept of mutualism?

- A) Small bugs feeding on rose leaves
- B) Bees pollinating flowers
- C) Infectious bacteria living on the blood of a host
- D) Wolves feeding on snowshoe rabbits

10. How do decomposers help other organisms in an ecosystem?

- A) They break down dead organisms and add nutrients back to the soil that plants use.
- B) They use the sunlight to make their own food that other organisms eat for energy.
- C) They help disperse seeds for plant growth.
- D) Decomposers do not help other organisms in an ecosystem.

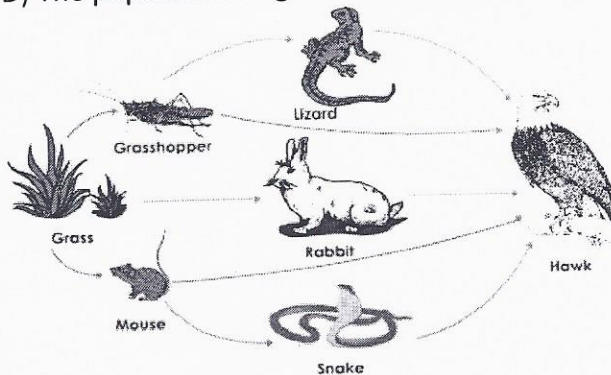
11. If a disease strikes the snake population in the food chain shown, what will happen to the populations of hawks?



- A) The population of hawks would decrease
- B) The population of hawks would increase
- C) The population of hawks would stay the same.
- D) The population of the hawks would increase and then decrease.

12. In the food web, if the population of grasshoppers increased, what would be a result?

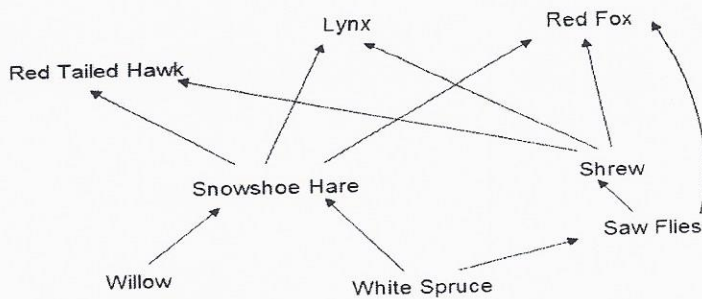
- A) The population of rabbits would decrease
- B) The population of lizards would decrease
- C) The population of snakes would increase
- D) The population of grass would increase



13. Which statement correctly describes the biomes listed below?

	Boreal	Temperate	Grasslands and shrublands
A	- Can survive drought and fire - Has acidic, nutrient poor soil	- Coniferous and deciduous trees - Nutrient rich soil	- Mostly coniferous trees - Abundance of grass with few trees
B	- Mostly coniferous trees - Has acidic, nutrient poor soil	- Coniferous and deciduous trees - Nutrient rich soil	- Can survive drought and fire - Abundance of grass with few trees
C	- Coniferous and deciduous trees - Has acidic, nutrient poor soil	- Mostly coniferous trees - Nutrient rich soil	- Can survive drought and fire - Abundance of grass with few trees
D	- Mostly coniferous trees - Has acidic, nutrient poor soil	- Can survive drought and fire - Nutrient rich soil	- Coniferous and deciduous trees - Abundance of grass with few trees

Use the food web below to answer questions 14 and 15.



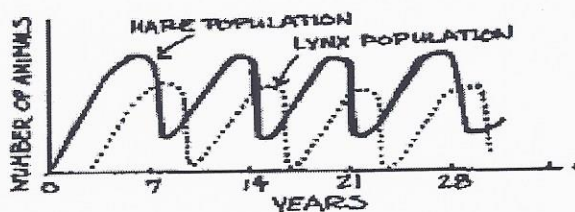
14. Based on the above food web, which organisms can be classified as first-order consumers?
- A) Red tailed hawk and snowshoe hare
 B) Willow and white spruce
 C) Shrew and saw flies
 D) Snowshoe hare and saw flies

15. Based on the above food web, which organisms act as both second-order and third-order consumers depending on the individual food chain they are involved in?
- A) Shrew and Red Fox
 B) Lynx and Red Fox
 C) Lynx, Red fox and Red tailed hawk
 D) Red Tailed Hawk and Saw Flies

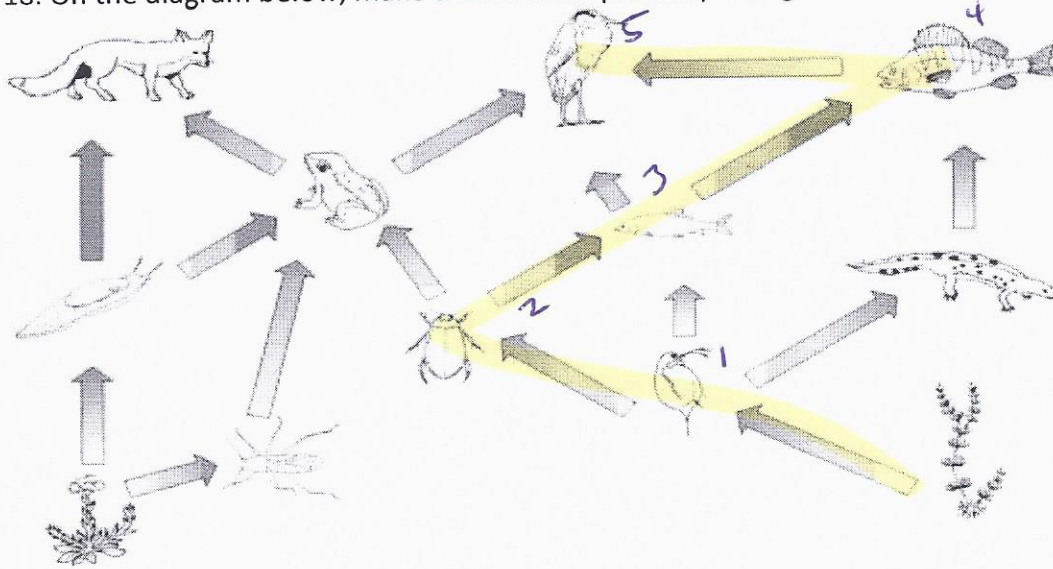
16. Which of the following choice only gives examples of biotic factors?
- A) Wind, sun, water, competition and disease
 B) Wind sun, water, soil and temperature
 C) Competition, disease, deaths, births and parasitism
 D) Births, parasitism, disease, rainfall and water

Short Answer

17. Use the graph below to help determine if the following statements are true or false.
- a- An increase in the lynx population will cause a decrease in the hare population. **T**
 b- A decrease in the lynx population also causes a decrease in the hare population. **F**
 c- As the hare population increases the lynx population also increases. **T**
 d- The cycle lasts approximately 28 years. **F**



18. On the diagram below, make a food chain pathway that goes until the 5th order consumer.



19. There has been a decline in the number of moles seen on prairie farms. This poses a problem to farmers because moles feed on mice and insects and therefore control their populations in the area. The mole's main predator is the barn owl whose numbers have increased in recent years. A biologist counted the number of moles and owls in the area in 2003. The results showed there were 74 moles and 8 owls. A second survey was made last year. The population of moles was at 66 and the owl population at 11 individuals. Explain what is happening to the mole population between 2003 and 2014, and provide a reason why.

Their population is decreasing because they are being eaten by the owl population which has increased.

20. Scientists wanted to monitor the population of tigers in the savannah over a 2 year period. Use the information on the table to determine whether there was an increase, decrease or stable population after the 2 years. Show the calculations.

	Births	Deaths	Emigration	Immigration
Year 1	9	4	7	3
Year 2	12	6	5	9

$B + I = 21 + 12 = 33$
 $D + E = 10 + 12 = 22$
 $33 - 22 = \uparrow 11$

in population

21. You counted 23 tulips in an 800 m² area, what is the population density?

$23/800 = 0.029/m^2$

22. The table below lists the contents of two aquariums, A and B, both with a capacity of 50 L.
Find the relative abundance of each species.

Aquarium A	Aquarium B
37 goldfish	35 goldfish
2 striped fish	30 striped fish
5 snails	31 snails
3 green algae	45 green algae
0 fern	32 ferns

Find the relative abundance for each species.

	Goldfish	Striped fish	Snails	Green algae	Ferns
Aquarium A	79%	4.3%	11%	6%	0%
Aquarium B	20%	17%	18%	26%	18%

Explain which aquarium has a greater biodiversity.

B - More species
- better distribution of species
3 - better total # of populations

23. Identify the type of interaction between the living organisms in each of the following situations. (competition, predation, parasitism, mutualism and commensalism)

A bird finds and lives in an old empty nest	Comm
A maggot lays eggs in a wasp	para
Crows eat the remains of an animal left by a wolf	Comm
Two gorillas are fighting over a mate	comp
Photosynthesis respiration processes	mut
A clown fish's waste provides food for the sea anemone, while the sea anemone provides shelter and protection to the clown fish	mut
Two wolves fighting over territory	Comp

24. State the biome being described in each statement.

Lack of clouds causes high temperature variations	desert
Depends on fire to allow new plant growth	grasslands
Temperature and light varies on depth	ocean
Not enough moisture for trees, but enough not to be a desert	grasslands
Current flows in 1 direction	river
Has permafrost	arctic
Rains all year long and very warm temperatures	Rainforest
Produces a large amount of the world's oxygen	rainforest
Has acidic, nutrient poor soil	boreal
Type of biome that has saturated soil	wetlands
Where fresh and marine water mix	estuaries
Has the ability to survive drought and fire	grassland
Sensitive to fire, insects and disease	boreal