Science 10: Climate & Ecosystems Exam Review Suggestions

Please note that you are responsible for all material that has been discussed or assigned within this course. The exam will consist of, but is not limited to, the material and topics listed below. Use the topics below as a place to start your studying!

1. Distinguish between abiotic and biotic factors affecting ecosystems.
2. (a) What is a biome? What major biomes are present in Canada?

(b) Why are biomes considered to represent the interaction between climate and ecosystems?

1. The figure below shows a forest food web. Use the figure to complete the table.



(a) Write the names of the producers in Column 1. Write the names of the consumers in Column 2.

(b) Identify the consumers as herbivores, carnivores, or omnivores (write answer in Column 3).

|  |  |
| --- | --- |
| Producers | Consumers |
| Name of Organism | Herbivore, Carnivore, Omnivore |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. (a) At what trophic level(s) would you find producers, consumers, and decomposers?

(b) Draw an energy pyramid, being sure to identify four trophic levels. If there is 455 000 kcal/m2 of energy available at the producer level, how much energy will be available at each trophic level? Include these values on your pyramid.

(c) Explain why the amount of energy available decreases as one moves up an energy pyramid.

1. (a) What is bioaccumulation / biomagnification?

(b) Use an example to explain how an animal living hundreds of kilometers away from an area contaminated with DDT might get DDT in its body.

1. (a) Represent the carbon cycle, including processes such as photosynthesis, respiration, decomposition, burning of fossil fuels, etc.

(b) Describe two human actions that are altering the carbon cycle.

1. (a) Represent the nitrogen cycle, including nitrogen fixation, nitrogen uptake, nitrification, denitrification, and so forth.

(b) List two human actions that are altering the nitrogen cycle.

(c) What is eutrophication?

1. (a) Distinguish between exponential and logistic growth.

(b) What is carrying capacity? Identify the four factors that determine carrying capacity.

(c) Distinguish between density-dependent and density-independent factors.

(d) Distinguish between interspecific and intraspecific competition.

1. Distinguish between mark-recapture and random sampling. Identify situations in which each would be the best choice for population estimation.
2. There are 19 frogs living in a swamp. Over the summer months, 6 frogs die due to predation and 11 tadpoles grow into adult frogs. 2 frogs move into the swamp and 3 frogs leave the swamp. What was the population growth rate at the end of the summer? [21%]
3. Calculate the population density of 926 grasshoppers on a 1 km x 2 km acreage. [463 grasshoppers/km2]

1. (a) What is biodiversity?

(b) Distinguish between vulnerable, threatened, extirpated, endangered and extinct species.

(c) Describe the four major threats to biodiversity.

(d) Describe three reasons why it is important to protect biodiversity.

1. (a) What is ecosystem sustainability?

(b) What are the four principles of sustainability?

(c) Describe the major effects of deforestation, agriculture, and resource exploitation on ecosystem sustainability.

(d) What is ecological restoration? How is First Nations’ knowledge used to guide this process?

(e) Describe two actions we as humans can take to help restore ecosystem balance.

1. (a) Is Earth’s climate changing? Is this a cause for concern? Explain.

(b) What is the anthropogenic greenhouse effect? Explain how it is caused and what effects it has or is predicted to have.

(c) Describe two human activities that could help to slow global climate change.