Nom: KEY

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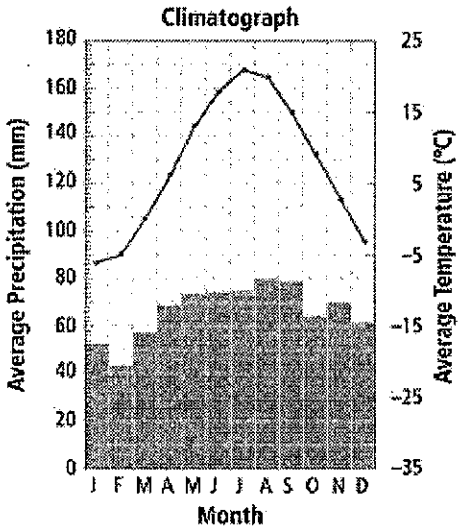
Ecology Review: Part 1

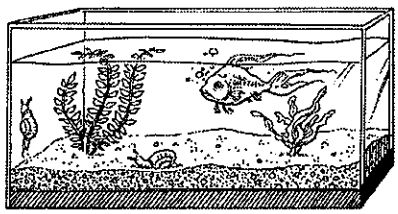
1. An ecologist measures the following factors and their effects on a boreal forest: the annual temperature, les quantity of minerals, and carbon dioxide levels. What is the term for what he is measuring? abiotic factors

2. In this biome, would the adaptations of animals include migration and hibernation in winter? Explain.



Yes - The winters are cold = less that 0°C (freezing)

3. What level of an ecological hierarchy would the gold fish represent?



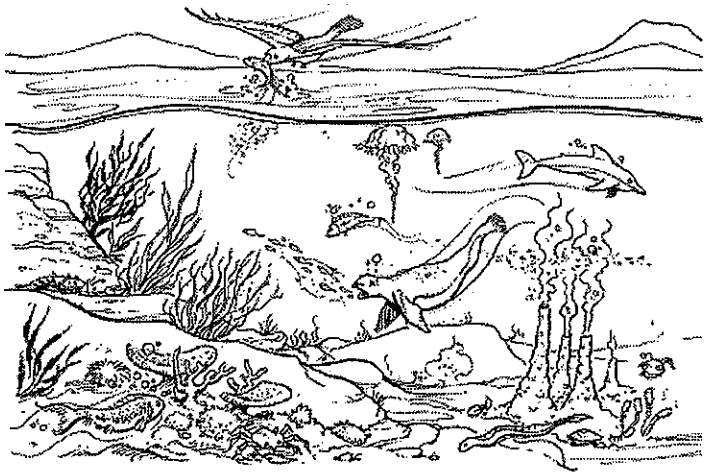
He is an organism

4. Tofino is in the temperate rainforest. Osoyoos, BC is in the desert. What abiotic factor would explain why there is more biodiversity in Tofino?

Tofino gets much more rain

* Answers may vary

5. a) Identify two abiotic factors and two biotic factors. Explain your choice.
   b) Describe the relationship between one biotic factor and one abiotic factor in this ecosystem.



a) Abiotic (non-living)
- water
- marine sediments
- currents
- wind
- rocks
- sand

Biotic (living)
- seal
- seaweed
- seagull
- coral
- eel

b) The ocean currents bring nutrients to the coral
as
sunlight is essential for photosynthesis in plants

6. What is the niche of a cedar?
- the cedar uses sunlight for photosynthesis
- the cedar absorbs water + nutrients from soil
- the cedar is a shelter for other animals + plants (like moss) in the forest

7. a) What are the definitions for latitude and elevation?
- latitude: distance (in degrees) from the equator (north or south)
- altitude: (elevation) height above sea level

b) Explain how increased latitude and increased altitude have similar effects on precipitation and temperature.

at high latitudes + elevations, temperature is lower

8. Complete the table

Biome	Climate and Conditions	Plants	Animals
desert	less than 25cm of precipitation per year - ~7°C - 38°C - hot days / cold nights	- cactus - plants that conserve water	- toads - scorpions - lizards - rabits - mice
permanent ice	- less than 50cm rain/year - ~ - 30°C to 9°C	- lichens - mosses	- penguin - polar bears - seals - artic fox - walrus
tropical rain forest	- more than 250 cm rain/year - poor soil - ~25°C	- tall trees - orchids - most variety of plants - vines	- parrots - jaguars - snakes - sloth
boreal forest	- harsh climate - temp. less than 0°C for 1/2 year - humid soil	- conifers - moss - ferns	- squirrels - hares - wolves - deer - seed eating birds
temperate rain forest	- more than 200 cm precip. / year - ~5°C - 25°C - near coasts	- tall trees - moss - lichen - ferns - mushrooms	- insects - birds - squirrels - chimpmunks
temperate deciduous forest	- precip ~ 75cm - 180cm/year - ~ -30°C to 30°C - big seasonal changes - fertile soil	- deciduous trees (loose leaves) - ferns - grasses - moss	- squirrels - rabbits - skunks - cougers - bears
Prarie / grasslands	- rich & fertile soil Temperate: precip: 25-100cm temp: -10 to 30°C Tropical: 50-100cm precip temp: 20-30°C	- grass - few trees	Temperate: Kangaroos, horses, wolves, rabbits, marmots, snakes Tropical: Giraffes, zebras
Tundra	- poor soil - permafrost - poor drainage - -30°C to 12°C - less than 25cm precip.	- bushes - small wild flowers - moss - small grasses	- birds - insects - caribou

9. Give an example of :

a) Parasitism intestinal parasites that rob host of nutrients

b) Commensalism birds eat insects that are freed from dirt by cows

c) Mutualism bees help flowers pollinate and flowers give food

d) Predation bears eat salmon

e) Competition two different plants are in competition for light & nutrients

10. Determine the biome of each of the locations.

	Location 1	Location 2	Location 3
Plants and animals	Mosses, lichens, caribou, ptarmigan	Maple, birch, geese squirrels	Pine, fir, moose, hare
Condition	Thin layer of soil, permafrost	Rich soil	Moist soil, swamps, shallow lakes
Annual precipitation	20 cm	110 cm	60 cm

Tundra Deciduous forest Boreal forest

11. a) To survive in the dry desert conditions, animals must do what?

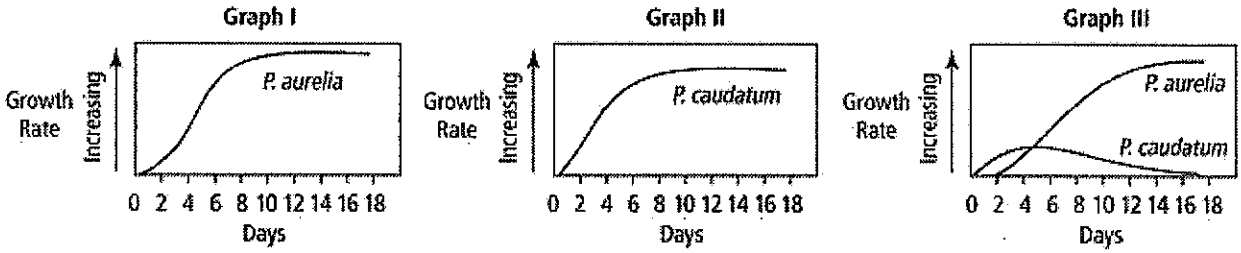
- conserve water

b) Describe adaptations of plants and animals that help them survive in this biome. Give an example of an animal and a plant and explain their adaptations.

Plants: cactus have thick stems
- plants have long & complex root systems

Animals: hide in day
- reptiles have scales

12. a) Describe the differences observed in each of the three graphics. (P. aurelia and P. caudatum are microorganisms.)



- Alone the organisms have similar growth curves
- Together, P. aurelia survives but P. caudatum dies off

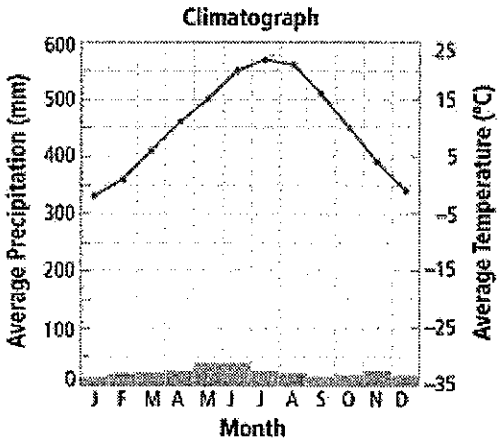
b) What evidence suggests the two populations influence each other?

The growth curves change when they are both present

c) What is the likely cause of the growth curves in Graph III?

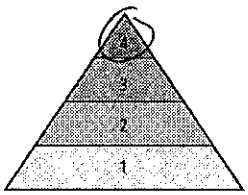
When both organisms are present, they compete and P. aurelia out competes P. caudatum and takes over.

13. Which biome might this be? Why?

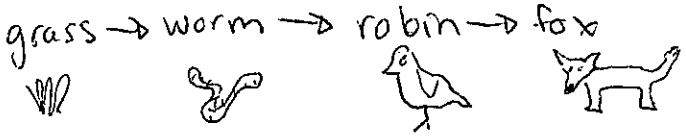


Desert: very little precipitation and temperature varies from ~ 0°C to 23°C

14. What level in the pyramid represents the least energy?



15. Draw a food chain that includes organisms from the prairie biome.



16. Which nutrient cycle is associated with...
    a) Geological uplift? phosphorus
    b) Guano islands? phosphosus
    c) Combustion of fossil fuels? carbon
    d) NO_3^- is converted into N_2? nitrogen
    e) Energy from sunlight + $6H_2O + 6CO_2 \rightarrow 6C_6H_{12}O_6 + O_2$ carbon

17. What are three biological processes and three human activities that contribute to the carbon cycle?

Biological
1. Photosynthesis
2. cellular respiration
3. Decomposition of plants + animals

Humans
1. Agriculture → changes land use
2. Urbanization
3. Mineral exploitation.

18. What are the principal reserves of carbon, nitrogen and phosphorus?

carbon- ocean sediments / sedimentary rocks
nitrogen- atmosphere
phosphorus- earth's crust

19. Explain why photosynthesis and cellular respiration are complementary processes?

Photosynthesis: uses CO_2 & produces O_2
Cellular respiration: uses O_2 & produces CO_2

20. What would happen if there were not detritivores or decomposers?

Detritivores & decomposers are consumers that recycle nutrients from dead organisms. These nutrients would not be available to the ecosystem if decomposers & detritivores didn't convert them into a usable form.

21. A farmer discovers that plants and fish are dying in a pond that is next to a field where he put nitrogen fertilizer. Explain what happened.

- Nitrogen enters the pond by run-off and leaching.
- Algae will grow & reproduce more quickly
- This will block sunlight so other plants will not have it
- The algae will also use oxygen & fish can die

22. What is the difference between bioaccumulation and biomagnification?

Bioaccumulation is the build up of toxins in an organism when it eats more and more of them over time
Biomagnification is the increased concentration of toxins at higher trophic levels.

23. How do heavy metals affect organisms?

Lead: poisonous
- causes anemia
- damages nervous system
- causes sterility in males
- lowers fertility
- kidney problems

Cadmium - Fish: increases death rate
- weakens growth & reproduction

Humans: lung problems (lots in cigarettes!)
- infertility
- damages nervous & immune system

Mercury: Humans: - damages nervous system, heart, kidneys, lungs
- weakens immune system