

### 3.1 Distribution of Organisms in the Biosphere

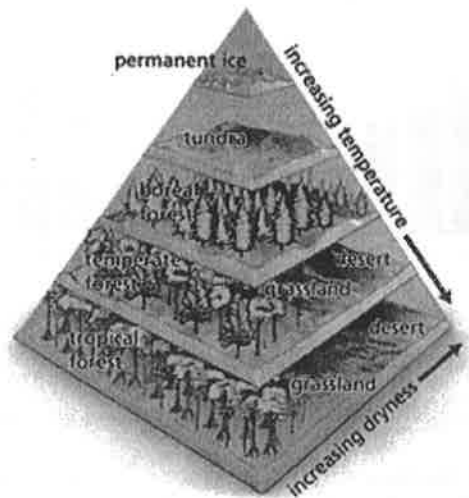
Date: \_\_\_\_\_

Warm up:

Study Notes/Questions

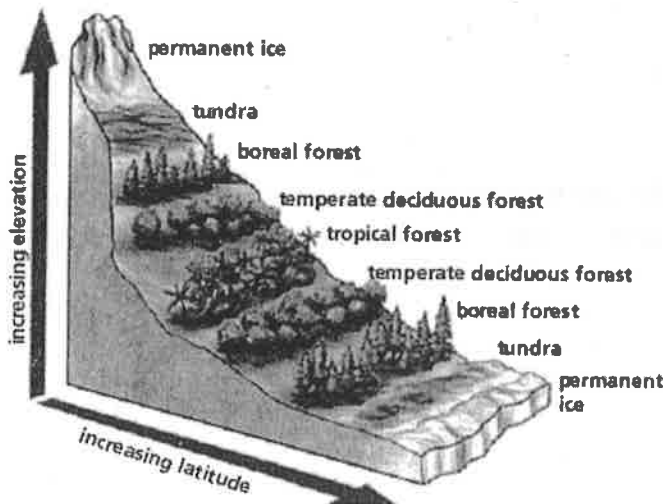
The distribution of living things is limited by the environmental conditions in different areas of Earth.

The distribution of life in the biosphere depends on abiotic factors like average temperature and precipitation (the climate).



Climate is affected by location on Earth,

both latitude and by elevation  
 (how far north and south) (how far above sea level)



proximity to the ocean also affects the climate (longitude)

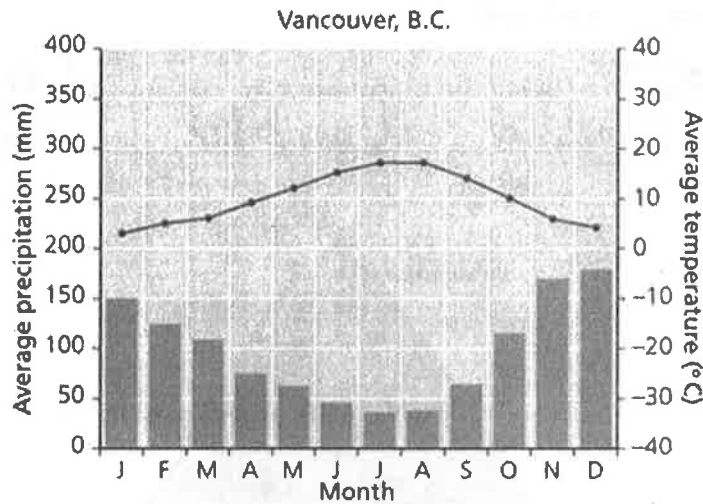
### 3.1 Distribution of Organisms in the Biosphere

Study Notes/Questions

#### Climatographs

Graphs that show both the average monthly temperature and average monthly precipitation for a certain location,

Bar graph shows precipitation, line graph shows temperature



#### Biomes

Biomes are major ecosystems with similar abiotic factors containing similar organisms.

We will recognize 8 biomes (Polar ice tundra, Boreal forest, temperate rain forest, temperate Deciduous Forest, Grassland, Desert, Tropical Rainforest, Gradual changes between neighboring biomes give transition zones)

Summary: (two to three sentences summarizing this section)

Self-Reflection Questions:

1. Describe one thing that you knew about this topic before today.

2. Describe one thing you learned about this topic today.

Warm up:

Study Notes/Questions

**Adapting to the Environment**

If the biotic or abiotic conditions in an ecosystem change, a population will

- adapt to the changes
- leave the area
- die out

Adaptation - any genetic trait that improves an organism's chance of surviving and reproducing

Natural Selection - a process that favours the survival of organisms that are better adapted to the environment, while eliminating organisms that are poorly adapted

Predation is a strong force in natural selection.

Characteristics that help predators include being faster, stronger or camouflaged

Characteristics that help prey include camouflage or chemical defenses

Coevolution - adaption of two different species in response to each other

E.g. herbivores with specialized beaks/teeth or digestive system plants with sharp thorns/spines or tough leaves

Mimicry - one species resembles another that is poisonous, dangerous, or distasteful to avoid predation

### 3.2 Adapting to the Environment

Study Notes/Questions

#### Biodiversity

The variety of organisms and the variation among them within a given ecosystem or biome

Varies by location, depending on abiotic factors.

Primary productivity – measure of the available energy from producers

Lots of producers (e.g. rainforests) means high primary productivity which supports biodiversity

Low primary productivity (e.g. deserts, tundra) have low biodiversity, more fragile ecosystems

Extinction results when a species is completely gone from Earth

Extirpation species no longer exists in one area

Keystone Species – a species that controls the types and the numbers of other species in the environment

Removal of the keystone species has a drastic effect on the ecosystem

(e.g. sea otter in kelp forest.)

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## Study Notes/Questions

Each species in a community occupies a different niche includes habitat, food, behaviours, etc) their role in the community

Competition occurs when organisms use the same resource

Interspecific Competition - between different species in the community

Intraspecific Competition - within a species (between individuals)

Resource Partitioning - differences in species allow them to use a resource in different ways (hawks hunt in day, owls hunt at night)

Adaptive Radiation - species become specialized to use smaller parts of niche (eg beaks to crush seeds, drink nectar or catch insects.)

### Foreign Species or Invasive Species

New species that enter an area but are not native to that ecosystem

Often they have no natural predators in the new ecosystem and can out-compete native species

Humans introduce foreign species intentionally with benefits (food crops)

Others are unintentional and may be harmful (ballast water)

### 3.3 Community Interactions

Study Notes/Questions

#### Succession

Succession is a process of gradual change in the types of plants that represent a community.

#### Primary Succession

Starts with a lifeless area without nutrients (bare rock)

Pioneer Species – first species in a new location (change environment to make it more suitable for other species)

Rock breaks down to make more soil, seeds arrive, more nutrients support larger plants and so on

Climax Community – stable ecosystem at the end of succession process

#### Secondary Succession

Occurs after a significant disturbance (fire, flood, clear-cutting) removes dominant plants but soil or sediments  remain

Nutrients present so plants come back quickly

Although succession focuses on plants, animals and decomposers are part of the climax community as well

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