**FOOD CHAINS AND FOOD WEBS**

A food chain is a series of organisms, each eating or decomposing the preceding one. However in nature the feeding relationships of living things are much more complicated than simple food chains. A sometimes complicated branching diagram which shows the feeding relationships of all living things in an ecosystem or particular area is called a food web. Energy is transferred from one animal to another through food chains and food webs.

* Every food chain begins with a producer organism
* Energy flows in the direction of the arrows
* Some energy is lost at each step in the food chain as heat
* The source of energy is the Sun.

**Trophic level**: the feeding level of an organism is its trophic level.

A simplified ecosystem is made up of:

* Tertiary trophic level: (decomposers) organisms that feed by breaking down the dead organic matter in an ecosystem
* Secondary Trophic level: (consumers) organisms that are unable to produce their own food, and consume plants and animals to obtain energy. There are various types of consumers e.g. primary and secondary consumers
* Primary Trophic level: (producers/plants) autotrophic organisms, they convert sunlight into energy through photosynthesis

**Biomass**

Biomass is a measure of the mass of all organisms at a particular trophic level. A biomass pyramid shows the total weight (biomass) of organisms at each level for a particular habitat. Note: if the biomass pyramid exists in an ecosystem in this form than the ecosystem is in equilibrium.

**Productivity**

Productivity is the rate at which biological matter (biomass) is produced by an ecosystem or part of an ecosystem. The more productive the ecosystem, the healthier it is.

**Energy:**

Energy in a food chain declines the further up the chain you go. For example, a producer has more usable energy than a tertiary consumer. This is because energy is lost by organisms through activity and also through heat.

**Biomes**

Major ecosystems which can be identified from a major or climax vegetation type are called biomes. Biomes obtain their names from the dominant types of vegetation found within them (e.g. grasslands, coniferous forests). A biome may cover a large area of a continent and may also be distributed across several continents. There are few undisturbed biomes left in the world today. Only in isolated area of continents and in some parts of the oceans, have humans left biomes relatively undisturbed.

**TASK:** Map world biomes on the world map provided.

Remember your mapping skills: (Border, Orientation, Legend, Title, Scale).

**Factors affecting the global pettern of vegetation (Biomes)**

Four main factors interact to produce distinctive biomes:

* Climatic factors
* Topographic factors
* Edaphic factors
* Biotic factors

Climatic factors

* Precipitation: the availability of water (both timing and intensity) impacts on the growth and type of vegetation growth
* Temperature: most plants prefer temperatures between 10oC – 35oC. Variations in temperature affect the types of vegetation which occur in an area.
* Light: Plants require light for photosynthesis – the intensity of light will determine the amount of energy available for photosynthesis. As a result some areas will have a greater biomass than others.
* Winds: winds can reduce water availability and increase the rate of transpiration of a plant. They can also aid in the transportation of pollen, spores and seeds. The amount of wind in an area will affect the types of plants which will be able to survive in an area.

Questions:

1. What is biomass?

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1. What is a terrestrial ecosystem?

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1. What is a niche?

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Topographic factors

* Altitude: As altitude increases there is a decrease in the number of plant species, height of plants, density of plants, growths rate of plants and length of the growth season.
* Slope: the gradient of an area affects the level of erosion, fertility and amount of moisture in the soil. These characteristics in turn affect vegetation types present.
* Aspect: the orientation of a slope alters sunlight and temperature conditions.

Edaphic factors

* Soils: the major biomes of the earth correspond not only with major climate zones but also with major soil types. Major features of soils which affect plants are:
	+ Soil structure
	+ Soil depth
	+ Mineral nutrients

Biotic factors

* Plant competition: plants compete with each other for sunlight, carbon dioxide and water. The relationship between different plants results in the basic components which make up the biome.
* Relationships between plants and animals: plants and animals interact and adapt to form an integral part of the biome.
* Human activities: Humans are the most significant biotic factor affecting the location of the biomes. A wide range of activities lead to human dominance of ecosystems.

Questions:

1. List 10 human activities that affect the location of biomes.

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**Biodiversity**

The term biodiversity is the term used for the variety of life and refers to:

* Diversity of genetic material;
* Diversity within ecosytems; and
* Diversity within species.

The earth’s biodiversity has taken 4 million years to evolve. Humans have increasingly had dramatic and sometimes irreversible effects on the global ecosystem.

Some important issues related to biodiversity are:

* Bio-indicator species
* Undiscovered and unnamed species
* Mass extinction and endangered species

**Preservation of biodiversity**

A number of strategies are used to try to maintain biodiversity. These include:

* National Parks/ World Heritage Areas
* Refuge areas
* Sanctuaries
* Conservation corridors
* Endangered species legislation
* Local communities and threatened species networks.

**TASK:** Draw a food chain with prawns, bacteria, cod, seagrass and sharks. Which is the producer, primary consumer, secondary consumer, tertiary consumer and decomposer? Which organisms are part of the primary trophic level, secondary trophic level, tertiary trophic level? Label the trophic level which has access to the most energy and least energy.