

**PENANG SANGAM HIGH SCHOOL**  
**P.O.BOX 44, RAKIRAKI**

**LESSON NOTES**  
**WEEK 21**

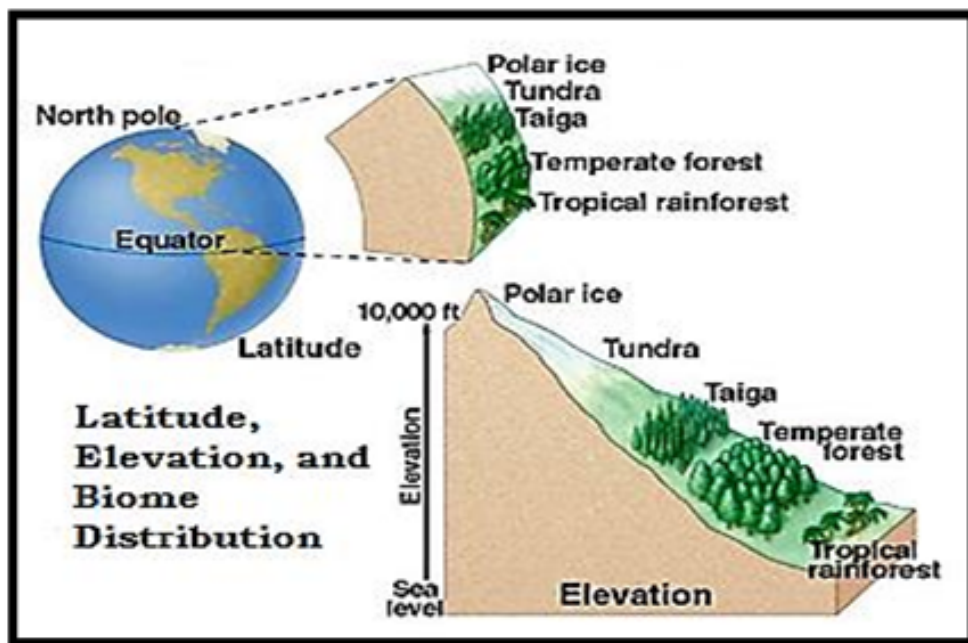
**Year/Level:** 13A/B

**Subject:** BIOLOGY

<b>Strand</b>	2 Living Together
<b>Sub Strand</b>	2.1 Organisms And The Environment
<b>Content Learning Outcome</b>	<ul style="list-style-type: none"> <li>• Define biomes and explain how they are formed</li> <li>• Briefly describe the aquatic and terrestrial biomes in Fiji</li> <li>• Discuss the types of climate and soils in Fiji</li> </ul>

**BIOME**

- A biome is a community of plants & associated animals which is characteristic of a climatic zone.
- **Temperature** is a major influencing factor establishing biomes.
- Since temperature varies with altitude, biomes are determined partially by **altitude** and primarily by **temperature** and **precipitation**.
- As altitude increases, temperature decreases which changes the structure and composition of the biome.



<https://socratic.org>

The Earth's Biomes are categorized into two major groups: **Aquatic Biome** & **Terrestrial Biome**

### 1. **Aquatic Biome**

- Categorized into **freshwater** (ponds & rivers) and **marine** regions

#### (a) **Freshwater Regions:**

- ✓ Includes area of land covered in water containing less than 1% saltwater.
- ✓ Plants & animals are adjusted to low salt content and cannot survive in high salt concentration
- ✓ Example: ponds, streams, lakes, freshwater wetlands

#### (b) **Marine Regions:**

- ✓ Covers about  $\frac{3}{4}$  of the earth's surface.
- ✓ Includes Oceans, Coral reefs, Estuaries.
- ✓ Marine algae supply much of the oxygen & also take in a huge amount of carbon dioxide from the air.
- ✓ Evaporation of seawater provides rainwater for land.

### 2. **Terrestrial Biome**

- Differ in climate, vegetation and animal life
- Includes tundra, deserts, forests, grasslands.

#### (a) **Tundra**

- ✓ Have extreme weather conditions with temperature very cold & harsh.
- ✓ Few plants & animals survive.

#### (b) **Forest**

- ✓ Characterized by humidity & adequate rainfall.
- ✓ Tall trees grow well.
- ✓ There are 3 main types of forests classed according to latitude & types of trees found.
- ✓ These include: tropical forest, temperate deciduous forest and boreal forest.

#### (c) **Desert**

- ✓ Have extreme weather conditions.
- ✓ Include 2 types: Hot deserts & Cold deserts
- ✓ Both types are very dry & receive very little rainfall.

#### (d) **Grasslands**

- ✓ Dominated by grasses rather than large trees & shrubs.
- ✓ 2 types: Savanna (grassland with scattered individual trees)  
Temperate grassland (characterized by grasses which are dominant vegetation type)

## **FACTORS THAT INFLUENCE BIOMES**

The distribution of terrestrial biomes is determined by three factors: **temperature, water, and sunlight.**

**Temperature:** affects length of growing season that is the number of consecutive days during which the temperature remains above 0°C. During this period plants must generate enough energy to reproduce or store enough energy to survive until the next growing season.

**Availability of water:** amount of water in soil is determined by the rates of precipitation and potential evaporation. Potential evaporation refers to the amount of water that would evaporate if sufficient water source were available.

**Availability of light:** the amount of light available is determined by latitude and the climate. Due to the tilt of Earth's axis, the greatest amount of sunlight reaches Earth's atmosphere between 23.5° north and 23.5° south. However, sunlight and plant growth in this region are often limited by the clouds.

**Continental drifts:** Alfred Wegener proposed the theory of continental drift, which states that the earth's continents were once a part of an enormous, single landmass called Pangaea (earth in Greek) which broke up and separated into pieces. The pieces of Pangaea slowly moved away to their current position today.

Continental shifts affects more land at higher altitudes:

- alters ocean current and therefore heat transport
- alters global atmospheric circulation
- more glaciers over land, higher albedo and cooler temperatures

The theory of continental drift is supported by plate tectonics.

**Plate tectonics** refers to the movement and interaction of tectonic plates. Tectonic plates are massive slabs of rock on which the continents rest. The movement of the earth's tectonic plate cause the continents to move or shift.

This results change in ocean current which in turn generates more heat. When these tectonic plates shift, the creation of the volcanic eruptions increases the degree of carbon dioxide (CO<sub>2</sub>) and sulfur dioxide (SO<sub>2</sub>) in the atmosphere leading to a rise in the temperature levels globally. However, if the movement is insignificant, volcanic activity will decrease and so would the temperature.

## **Climate**

- Climate is the *long-term pattern of weather in a particular area*.
- Climate is determined by the **average temperature** and **precipitation** determines the location of organisms (plants and animals).
- Plants and animals are distributed in the following zones:

**Wet zone:** refers to the windward climate with high rainfall that is on the southern and eastern lowlands of larger islands

**Dry zone:** leeward climate with low rainfall and marked dry season that is on the northern and western lowlands of mainlands.

## **Soil Type in Fiji**

- Topographically, the soil of Fiji can be divided into three main types: soils developed on flat and soil developed on gentle slopes and soil develops on steep hills and mountains.

- Soil on flat land is of two types:
  1. **Young sandy soils** are found in the coastal areas of the islands and are derived from sea deposits.
  2. **Soils derived from river deposits (alluvial soils)** are found in river basins. These are generally fertile, deep, and agriculturally very valuable.

On the rolling land and gentle slopes there are few kinds of soils:

**Shallow and black soils:** are formed from the parent materials that are rich in nutrients (magnesium and calcium). It is good for pastures or vegetables cultivation.

**Sandy or silt soils:** are derived from volcanic ash. They are very fertile, often acidic and occur in high rainfall areas.

**Clay soils:** are derived from basic materials and often acidic. They are low in nutrient status however, can be cultivated if properly fertilized.

**Gravel and clay soils:** are usually covered with ferns, derived from strongly decomposed materials.

**Sandy and clay sub – soils:** are derived from acidic parent materials.

Soil characteristic can be changed by both natural phenomena and human intervention. ***Repeated burning of the plant cover through lighting or induced fire by humans reduce the fertility of the soil.***

**Talaisiga** means sun-baked and refers to seriously affected soils; useless to humans.

**Dravuisiga** refers to not so seriously affected land which has low nutrient content that crops like cassava (with low nutrient tolerance) can grow.

#### Activity:

1. Discuss the factors affecting tolerance range.

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2. State the factors affecting the aquatic and terrestrial biome.

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