

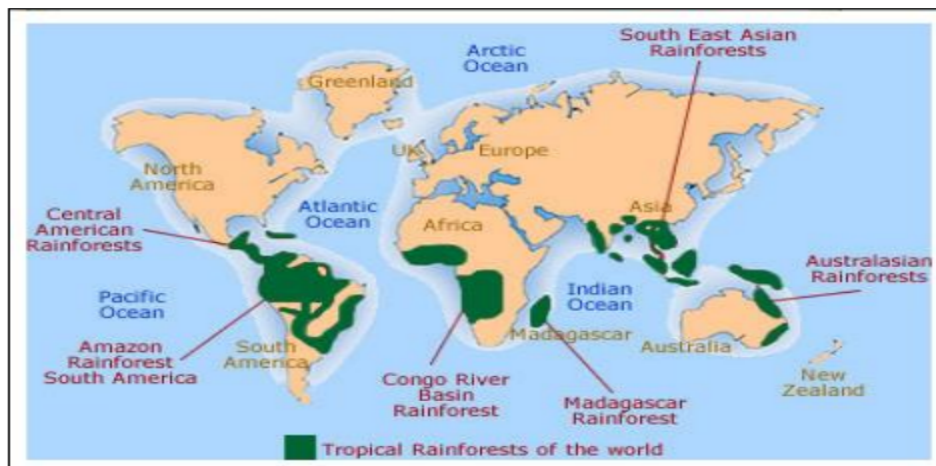
**PENANG SANGAM HIGH SCHOOL**  
**P.O.BOX 44, RAKIRAKI**  
**YEAR 13 GEOGRAPHY WORKSHEET 6 – WEEK:16,17,18**

**LESSON NOTES & ACTIVITIES**

<b>Strand</b>	Physical Geography
Sub Strand	Vegetation
Key Learning Outcome	Factors influencing their growth and distribution
	Impacts of climate change on vegetation

**Types of Biomes**

1. **Tropical rainforest** Location – found in hot, humid environments in equatorial climate. Tropical rainforests are found mainly along the equator between 23.5° N and 23.5° S of the equator. Distribution: Between latitude of 23.5° N and 23.5° S of the equator which has a tropical climate. Tropical climate has high annual temperature and rainfall. Soil heavily leached due to soil erosion and annual rainfall. Examples are Amazon Basin, Malaysia and Indonesia in Southeast Asia , The Congo Basin in Africa.



Source: <https://mrogren.wikispaces.com>

**Features**

- Contain the most diverse range and highest volume of plant and animal life found anywhere on earth.
- Trees grow very close to each other, making the forest very dense .
- Tropical forests trees are vergreens as the leaves remain green throughout the year
- Some plants called **epiphytes** overcome the shortage of sunlight by growing high up on tree branches to get sunlight (eg. Ferns, orchids).
- Other plants known as **lianas** grow upward to get more sunlight by winding around tree trunks

- The **bark of trees** in the tropical rainforest is thin because they are not required to protect the trees from dry or cold conditions
- Branches are also located in the top one-third portion of the **trunks** and they are shaped like umbrellas to capture as much sunlight as possible.
- **Roots** of tropical forest trees are shallow because they do not need to reach deep into the soil for water
- Some of the tallest trees have **butress roots** to support their great weight and prevent them from falling over.
- A mature equatorial rainforest has a distinct structure of five layers: Emergent layer, Canopy layer, Understory layer, Shrub layer- consists of shrub and small trees which are adapted to living in the shade of their taller neighbors and the Undergrowth.

## 2. **Tropical grassland**

**Location** – located further away from the equator than the tropical rainforest biome in the central part of Africa and in South America. Examples include Llanos (Venezuela), the Campos (Brazil), central Africa surrounding the Congo Basin, parts of Mexico and northern Australia.

### **Feature**

- Include shrubs, grasses and occasional trees which grows near water holes, seasonal rivers or aquifers.
- The ‘closed savanna’ is mainly trees and grasses.
- The ‘**open savanna**’ is vegetated by scattered tufts of grass
- Some trees are **deciduous** while others are xerophytic or drought resistant • Leaves are small and waxy and sometimes **thorn-like**
- Roots are long to tap groundwater
- Trunks are gnarled
- Bark is thick to reduce moisture loss

## 3. **Desert vegetation**

**Location** – found at the lower latitudes between the tropic of cancer and the Tropic of Capricorn.

Examples. Sahara Desert in Africa is 3.5 million square miles and Atacama Desert in Chile which gets about ½ inch precipitation annually.

**Features** – very hot and dry, extremely hot in the day and cool at night. **Fauna** – very little animal survived. Those that survived have learnt to live with very little water and food. Most are **nocturnal**, meaning, they sleep during the heat of the day and active during the night. - **Flora** – plants that survive in the biome have learnt to survive with little water.

**Soil** - because of the dry weather, there is no significant weathering of bed rock or the accumulation of organic material. In the relatively few places where the water table is near to the surface, soil moisture is likely to be drawn upwards by capillary action. Desert soils are unproductive mainly because of the lack of moisture and humus, but not particularly infertile especially when irrigation is used.

**Climate** - Hot and dry which makes it very hard for too many types of plants and animals to survive in such biomes.

## 4. **Mediterranean vegetation**

Location – found on the west coast of continents between 30° and 40° north and south of the equator.

Features –

vegetation mostly **xerophytic** (drought resistant) is described as ‘woodland and sclerophyllous scrub’. **Sclerophyllous** means ‘hard leaved’ and is used to describe those evergreen trees or shrubs that have small, hard leathery waxy or even thornlike leaves and which are efficient at reducing transpiration during the dry summer season. - most of the trees are evergreen, maximising the potential for photosynthesis. - trees such as the cork oak have thick and often gnarled bark to help reduce transpiration - olive and eucalyptus have long tap roots in which to reach groundwater supplies, in some cases have bulbous roots to store water.

### 5. **Temperate grassland**

Location – lies in the centre of the continents approximately between latitude 40° and 60° north of the equator. Examples: North American Prairies and the Russian steppes.

Features - two main types of grass found in the area, feather grasses that grow to 50 cm and form a relatively even coverage whereas tufted (tussock) grasses reaching up to 2 metres are found in more compact clumps. The grasses provide for burrowing animals such as rabbits and herbivores such as bison and antelopes. - Herbaceous plants and some trees (willow) grow along the water courses - The temperate grasslands are a resilient ecosystem.

### 6. **Temperate deciduous forest**

Location – found on the west coasts of continents between approximately latitudes 40° and 60° north and south of the Equator. Examples: north-west Europe, north-west of the United States of America, British Columbia, southern Chile, Tasmania and South Island, New Zealand. The deciduous forests are located in the temperate zone above the tropical forests and below the coniferous forests. Most of Europe, the eastern half of North America, parts of Japan and Asia were once covered with large deciduous forests.

Features

- The word “Deciduous” means “falling off or out at a certain season”. That explains why deciduous forest means a forest in which the leaves fall off the trees when the winter comes.
- In Britain the trees have a growing season of 6-8 months in which to bud, leaf, flower and fruit, and may grow by about 50 cm a year
- The forest floor, if the shrub layer is not too dense, is often covered in a thick undergrowth of brambles, grass, bracken and ferns
- Many flowering plants (bluebells) bloom early in the year before the taller trees have developed their full foliage.
  - Epiphytes often grow on tree trunks .
  - Forest floor has a reasonably thick leaf litter which is readily broken down by the numerous mixing agents living in the relatively warm soil, there is a rapid recycling of nutrients although some are lost through leaching
- Deciduous trees give way to conifers towards polar latitudes and where there is an increase in either altitude or steepness of slope.

### 7. **Coniferous forest/taiga**

Location – Coniferous forests occur in cold climates to the poleward side of 60°N in Eurasia and North America as well as at high altitudes in some temperate latitudes and in Southern Chile. Examples: Japan, China, Europe and North America.

Coniferous forest, vegetation composed primarily of cone-bearing, needle-leaved, or scaleleaved evergreen trees, found in regions of the world that have long winters and moderate to high annual precipitation. The northern Eurasian coniferous forest is called the taiga, or the boreal forest. Both terms are used to describe the entire circumpolar coniferous forest with its many lakes, bogs, and rivers. Coniferous forests also cover mountains in many parts of the world. Pines, spruces, firs, and larches are the dominant trees in coniferous forests.

### 8. . **The Tundra zone**

Location - Located on the north of the taiga, includes the extreme northern parts of Alaska, Canada and Russia together with all of Greenland. In Finnish, tundra means a "barren or treeless land. A cool forestless landscape type, developed almost exclusively in the northern hemisphere.

#### Features

- The tundra vegetation consists of moss and lichen formations with various grasses, dwarf shrubs and, sometimes, large shrubs.
- ♣ Very low organic productivity 2. Influence of Climate and soil
- ♣ Climate – lengthy periods of continuous daylight but with the angle of the sun so low in the sky, temperatures struggle to rise above freezing point.
- ♣ Soil – the limited plant growth of this biome only produces a small amount of litter and as there a few soil biota in the cold soil, organic matter decomposes only very slowly to give a thin peaty layer of humus or mor.

#### **Degradation of Vegetation**

##### Man made causes;

- Deforestation – clear cutting/ indiscriminate logging
- Mining – removal of vegetation 2. Natural Causes
- Natural disasters
- Soil salinisation
- Water logged soils
- Climate change Impacts of Climate Change on vegetation
- Shift in distribution and species
- Extinction of species
- Change in flowering times
- Change of competition between plants The Impacts of Deforestation
- flooding
- landslide due to soil erosion
- loss of biodiversity of plants and animals
- decrease in oxygen and increase in carbon dioxide

#### **Conservation Measures for sustainability**

- Debt for Nature swap - Debt-for-nature swaps are financial transactions in which a portion of a developing nation's foreign debt is forgiven in exchange for local investments in environmental conservation measures.
- Education – conservation measures to be included the syllabus of a country's education system where students learn the importance of conservation

- Public Awareness – awareness programmes taken out to communities vulnerable to environmental degradation
- National Parks/Reserves – specific areas identified by environmentalist to be demarcated for reserve forest.
- Cropping - Cultivated plants or agricultural produce, such as grain, vegetables, or fruit, considered as a group
- Selective tree felling - is the silvicultural practice of harvesting trees in a way that moves a forest stand towards an uneven-aged or all-aged condition, or 'structure'.
- Strip/alley cutting - is a system in which long and narrow clear-cuts are made, with alternating uncut strips of forest left between
- Crop felling - is the process of downing individual trees, an element of the task of logging. • Pollarding

### Activity

Fill in the Biomes Table below with features .

Biome	Climate	Location	Plants	Animals
Desert				
Deciduous Forest				
Grassland				
Taiga				
Tundra				
Tropical Rainforest				

2. Define the term pollarding.
3. Explain why trees are pollarded.
4. Describe why pollarding is and example of sustainable management.
5. Explain why pollarding leads to the survival of ancient trees.
6. Suggest why trees are re-pollarded today.
7. explain how ecotourism can offer opportunities to protect rainforests from deforestation.

**Essay:** With reference to specific case studies, discuss whether you think forest is being managed sustainably.

**Research and present:** Malaysia's tropical rainforest – include a map of its rainforest. Discuss the threats to the rainforest (e.g. logging, mining, energy), efforts by government to sustainably manage the rainforest (e.g. debt relief, carbonsinks, National Forest Policy, Selective Management System, Forest Stewardship Council to name a few initiatives)