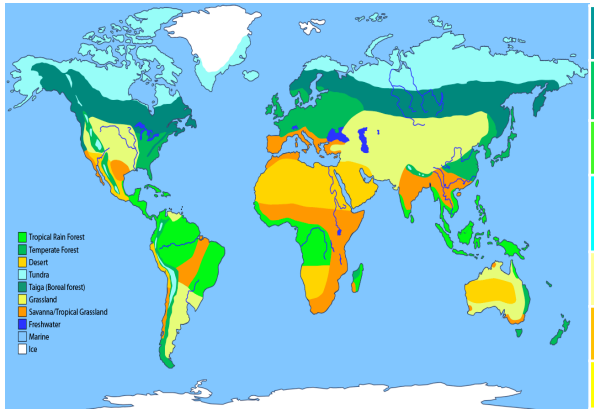
YEAR 9 UNIT 1: Tropical Rainforests

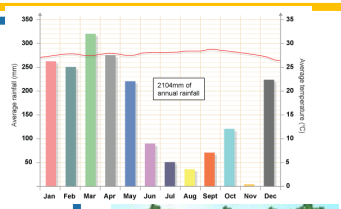
Biomes - A biome is a large geographical area of distinctive plant and animal groups, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.

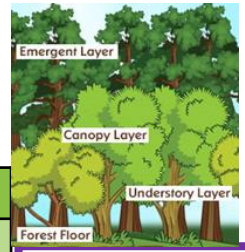


	Coniferous forest
	Deciduous forest
	Tropical rainforests
	Tundra
	Temperate grasslands
	Tropical grasslands
	Hot deserts.

Rainforest Distribution Tropical rainforests are centred along the Equator between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. The Amazon is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.

Climate - Evening temperatures rarely fall below 22°C. Due to the presence of clouds, temperatures rarely rise above 32°C. Most afternoons have heavy showers At night with no clouds insulating, temperature drops





Structure

Emergent - Highest layer with tree reaching 50 metres.
Canopy - Most life is found here as It receives 70% of the sunlight and 80% of the light.
U-Canopy - Consists of trees that reach 20 metres high.
Shrub layer -Lowest layer with small trees that have adapted to living in the shade.

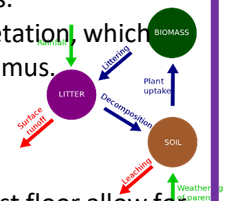
Biome's climate and plants

Biome	location	Temperature	Rainfall	Flora	Fauna
Tropical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate forest	Between latitudes 40°-60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500m /year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

Nutrient Cycle Plants take in those nutrients where they are built into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by decomposers.

Litter This is the surface layer of vegetation, which over time breaks down to become humus.

Biomass The total mass of living organisms per unit area.



The hot, damp conditions on the forest floor allow for the rapid decomposition of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become infertile.

Adaptations to the Rainforest

Sloths - Are camouflaged to forest environment.
Buttress Roots - Support tall trees & absorb nutrients.
Drip Tips - Allows heavy rain to run off leaves easily
Lianas & Vines - Climbs trees to reach sunlight at canopy.

Rainforest Inhabitants

Many tribes have developed sustainable ways of survival, such as

Shifting cultivation.

The forest provides inhabitants with food through hunting and gathering.

Natural medicines from forest plants.

Homes and boats from forest wood.

Effects of Human Activity on the Rainforest

Logging – Most widely reported cause of destructions to biodiversity. Timber is harvested to create commercial items such as furniture and paper. Has lead to violent confrontation between indigenous tribes and logging companies.

Agriculture - Large scale 'slash and burn' of land for ranches and palm oil.
Increases carbon emission. River saltation and soil erosion increasing due to the large areas of exposed land Increase in palm oil is making the soil infertile.

Mineral extraction – Precious metals are found in the rainforest. Areas mined can experience soil and water contamination. Indigenous people are becoming displaced from their land due to roads being built to transport products.

Tourism - Mass tourism is resulting in the building of hotels in extremely vulnerable areas. Has caused negative relationships between the government and tribes Tourism has affected wildlife (apes) by exposing them to human diseases.

Benefits of the Rainforest

Raw materials - Commonly used materials such as timber and rubber are found here.
Water - Controls the flow of water to prevent floods/droughts regions..
Food - Important foods such as bananas, pineapples and coffee are grown there.
Health - 25% of modern medicines are sourced from rainforest ingredients.
Energy - Large dams generate 2/3 of Brazil's energy needs.
Climate - Acts as carbon sinks by storing 15% of carbon emissions.

Case Study: Sustainable Rainforest Management in Costa Rica

Location & Background

Costa Rica is a small country in Central America.
It is home to 6% of the world's biodiversity.
The country attracts 6 million tourists a year.

Ecotourism

Ecotourism is tourism that is directed towards the natural environments & conservation. Monteverde is a popular ecotourism destination in the country.

Advantages

- 80 new businesses have open in Monteverde.
- 400 full-time and 140 part-time jobs directly related to tourism in Monteverde.

Disadvantages

- Land prices have increased.
- Deforestation to clear areas for tourism industry.

Threats to the Costa Rican Rainforest

- Cattle Ranching and agricultural development by clearing land through slash & burn methods.
- Gold and other metal mining meant large scale soil and rock removing. This meant areas were deforested and chemicals entered water systems.
- By 1990, 32,000 hectors of forest were cut down each year – devastating the fragile ecosystem.

Rainforest Management

- Government created 28 National Parks with 24% of the country's land protect.
- Laws and enforcement meant that deforestation had fallen from 1.8 to almost zero by 2005.
- Agroforestry encourages growing trees and crops together to create better farming conditions.
- Afforestation has led to the replanting of trees to replace original forest that have been lost.