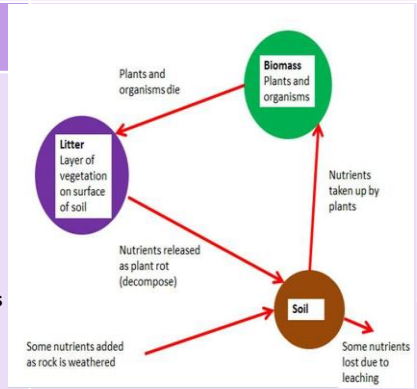
The nutrient cycle

The nutrient cycle describes how nutrients are transferred around an ecosystem.

Components of nutrient cycle

1. Soil
2. Litter
3. Biomass

Each is a store for nutrients. Nutrients are transferred between the stores. The size of these stores is different in different ecosystems, as is the amount of nutrients transferred between the stores.



What is deforestation?

- It is the clearing (cutting down) of the Earth's rainforests.
- At the current rate of deforestation the earth's rainforests could be gone in less than 100 years.

Causes of deforestation

- Agriculture. Farmers cut forests to provide more room for planting crops or grazing livestock little cattle. Many fast food chains are linked to deforestation due to demand for meat.
- Logging companies, which provide the world's wood and paper.
- Loggers, some of them acting illegally, also build roads to access more and more remote forests which leads to further deforestation.
- Forests are also cut down as a result of growing settlements. (cities, towns or villages).

Effects of deforestation

- Loss of habitat for thousands of species of animals and plants.
- Loss of biodiversity and possible extinction of species.
- It is linked to increased climate change. If there are no trees to block sunlight, soils dry out and become like deserts killing more plants and animals.
- Trees are a source of oxygen and use carbon dioxide so less trees means less oxygen in the atmosphere.
- Tribes who have lived in the rainforest for generations lose their home and are often forcibly removed and rehoused elsewhere, changing their way of life forever.

Extreme environments Year 8 Knowledge Organiser

Adaptation in the rainforest

- It is estimated that 50% of the worlds plant and animal species live in tropical rainforests.
- A typical 1km2 area of TRF contains 3000 species of flowering plants, 800 bird species, 300 butterfly species and 200 reptile species.
- Adapt means when plants (vegetation) & animals have changed and developed special features to live in the rain forest successfully.

Toucan

- Bright colours are to attract a mate.
- Toucans nest in tree holes to keep themselves hidden from prey.
- The large colourful bill is meant to deter predators.
- Strong claws can grip onto trees/ branches easily.

Buttress roots

- Rainforests have a shallow layer of fertile soil, so trees only need shallow roots to reach the nutrients, so many tropical trees have developed huge buttress roots. These stretch from the ground to two metres or more up the trunk and help to anchor the tree to the ground.

Lianas

- These are woody vines that start at ground level, and use trees to climb up to the canopy where they spread from tree to tree to get as much light as possible.

Fan palms

- These have large, fan-shaped leaves that are good for catching sunshine and water.
- The leaves are segmented, so excess water can drain away.

Three toed sloth

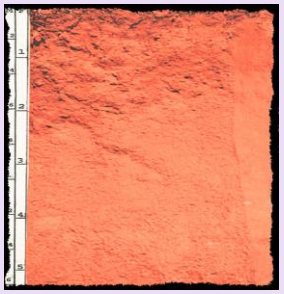
- Only comes down to the forest floor once a week- to avoid being attacked by large predators.
- Very strong legs and claws to hang still for a long time.
- Greenish algae on its fur provides camouflage.

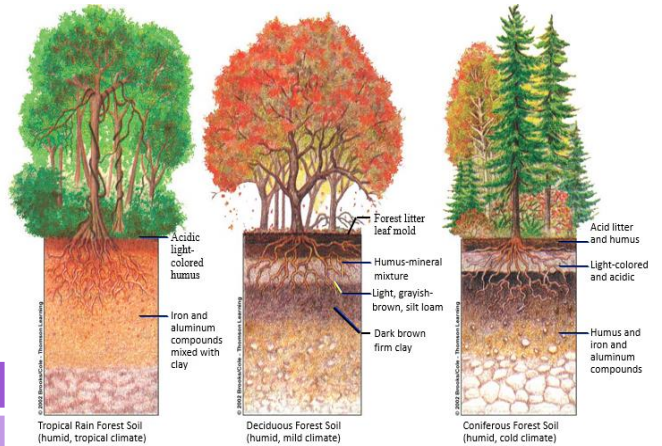
What is soil?

Tropical rainforest soils are reddish and iron-oxide rich, lacking in nutrients.

How it is made.

Soils are complex mixtures of minerals, water, air, organic matter, and countless organisms that are the decaying remains of once-living things. It forms at the surface of land – it is the "skin of the Earth." Soil is capable of supporting plant life and is vital to life on Earth





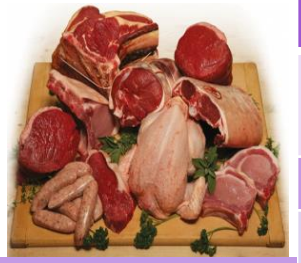
Ways to be sustainable in the rainforest

Sustainable is to use something without causing damage to the environment so it is there for future uses.

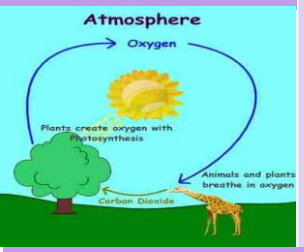
1. Only cut down a third of the trees in an area.
2. Slash and burn small areas of the forest.
3. Replant two trees for every one that you destroy.
4. Buy from companies that protect the rainforest.
5. Allow small numbers of tourists to stay with local people/tribes.
6. Try to listen to local tribes and follow their examples.
7. Use rubber tapping to make money (only take sap from tree/don't cut it down).

Definitions of weather and climate

- Weather-The weather is a description of the day-to-day conditions of the atmosphere.
- Climate-Climate is the average weather over a long period of time (usually 30 years).



Goods- things which the biosphere gives us (products) e.g. meat and fruit.



Services- a service or action that the biosphere provides for us e.g. the green lungs

How the TRF provides resources

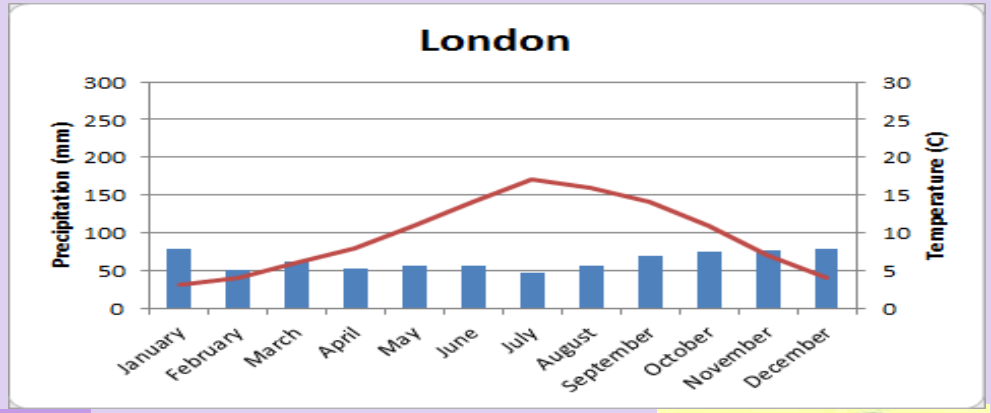
- **Food-** Bananas, nuts, tea, coffee, palm oil. all originated in the rainforest.
- **Medicine-** Many types of medicine (more than 700) come from plants e.g. malaria (quinine). Heart conditions, diabetes, cancer (rosie periwinkle) etc.
- **Minerals-** Minerals such as gold and silver are found in rocks.
- **Materials-** Building materials such as wood- teak, mahogany.
- **Fuels-** Wood-can be burnt as a source of heat & energy.

- **Recreation-** Increasingly TRFs are exploited by travel companies bringing large groups of tourists. E.g. zip wires

What are climate graphs?

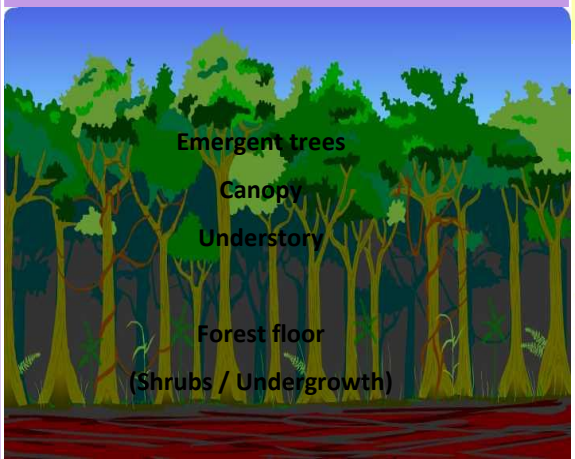
A climate graph has 2 variables plotted in it. It tells us the *temperature* and the amount of *precipitation* for each month of the year in a certain location. Precipitation is always represented with bars and temperature with a line..

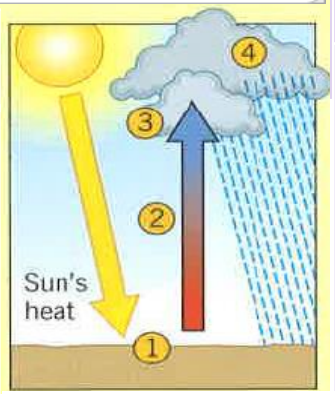
Example of a climate graph



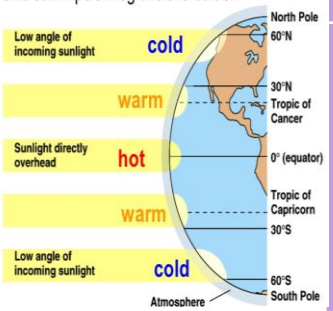
Layers (stratified) of the tropical rainforest

- **Emergent- 50m or taller. Usually supported by buttress roots.**
- **Canopy- A dense layer. Trees are 20-30m high. Many hardwood trees such as Mahogany.**
- **Understory-Dark and humid area containing saplings and shrubs.**
- **Forest floor- Covered with ferns and a deep layer of litter – fallen leaves and branches.**

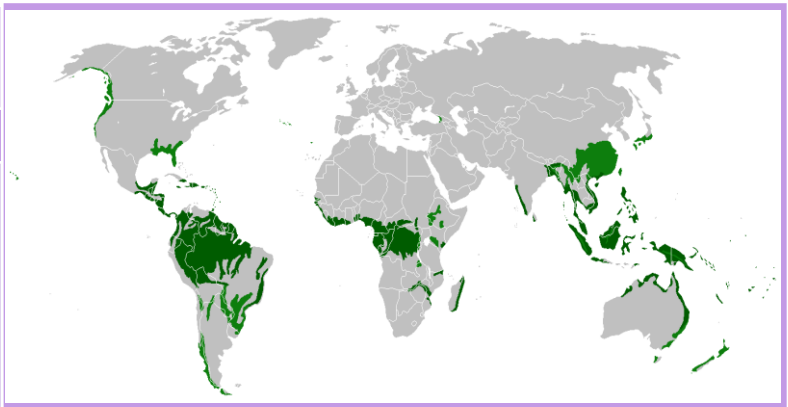




Earth's atmosphere is warmer near the equator where the Sun's ray are more direct. The north and south polar regions are colder.



Location of tropical rainforests



Location: Mostly on the equator and up to 23.5º either side. The rainforest is more common in the southern hemisphere. It is not found in Europe or Antarctica. Examples include the Amazon Rainforest and the Borneo Rainforest. The case study we use is the Amazon Rainforest.

Convectional rainfall

This precipitation is caused by very HOT WEATHER heating the ground:

1.Sun beats down

2.The ground becomes very hot and heats the air above it

3.The hot air rises = evaporates

4.When it reaches the cool air up in the atmosphere it condenses to form clouds

5.It rains – usually hard as this is a quick and intense process.

The climate of the tropical rainforest

In a tropical rainforest, the climate has the following characteristics:

- **The temperature does not vary much with an average of ~27oC.**
- **Precipitation (rainfall) with an average of ~ 250 cm per year.**
- **The rainforest has lots of precipitation because it is very hot and wet.**

Why are tropical rainforests so hot?

- **Tropical rainforests are situated in the tropical climatic zone, which is the warmest area of our world. They are very close to the equator where the sun always shines directly overhead, which means temperatures are very hot.**
- **The tropics do not have seasons like we experience in the temperate zone, where we have Autumn, Winter, Spring and Summer, and the weather changes for each season.**
- **In the tropics there are two seasons: WET and DRY. Even in the wet season it is still hot!**