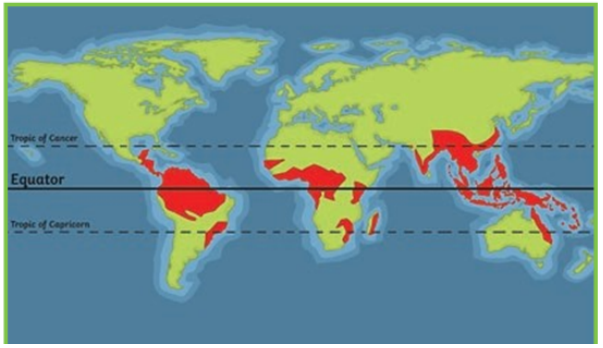
YEAR 7 GEOGRAPHY – - TROPICAL RAINFOREST AND CLIMATE CHANGE

1. KEY VOCABULARY

Emergent Layer	The tallest layer - over 40 metres. The trees here have small, waxy leaves to prevent them drying out.
Canopy	The second highest layer (35-40m). This layer blocks out the sun to other layers and contains the most plant species.
Understory	Low light conditions (2-15%). Contains small shrubs and plants.
Forest Floor	Very little light reaches the forest floor (2%) - so plants grow slowly.
Adaptation	**T**he adjustment of organisms to their environment in order to improve their chances at survival in that environment
Deforestation	The removal of trees
Sustainable	The practice of using natural resources responsibly
Ecosystem	includes all the living organisms in an area. It is an area where plants and animals interact with each other and the non living elements in an area e.g. the soil, climate and water.

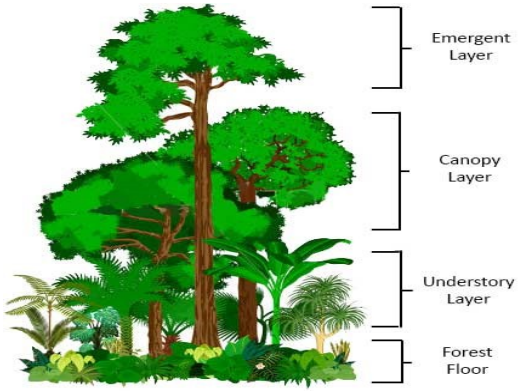
2. GLOBAL DISTRIBUTION OF TROPICAL RAINFORESTS

Most of the world's tropical rainforests lie between the Tropic of Cancer and the Tropic of Capricorn. Tropical rainforests are found on either side of the equator in South America, Central Africa, South East Asia and Northern Australia.. The world's largest tropical rainforest (the Amazon) is found in South America.



3. PHYSICAL CHARACTERISTICS OF A TROPICAL RAINFOREST

- Hot all year round (20-28°C) - Equatorial climate - Very wet (2000mm average rainfall per year)	- Rain is intercepted (caught) by the canopy - Continual growing season - Absorb CO2 and release oxygen	- Hundreds of plants and animal species including snakes and monkeys	- Epiphytes (plants that feed off other plants and take moisture from the air) - for example: ferns - Conventional rainfall - The soil is not very fertile due to nutrients being taken by the trees



4. HOW PLANTS AND ANIMALS ADAPT TO THE RAINRAINFOREST

Trees	Animals
- Large buttress roots to absorb nutrients - Have thick waxy leaves to repel water - Have thin bark to keep cool	- Many animals live in the canopy where there is lots of food - Strong limbs to swing and jump between trees - Camouflaged to hide from predators

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5. DEFORESTATION AND ITS ECONOMIC AND ENVIRONMENTAL IMPACTS

Causes of Deforestation in the Amazon

Ranching, logging and small-scale farming

Large-scale farming, e.g. Brazil is the world's second largest soya bean producer.

Road building opens up the rainforest to further development.

Dam building to produce HEP, e.g. Belo Monte dam complex is under construction and will be the world's fourth largest HEP dam complex.

Mining, e.g. the Carajas complex in Brazil is the world's largest iron ore mine. It produces 109 million tonnes of iron ore a year.

Economic Impacts

Farming significantly contributes to the economy, e.g. ranching earns Brazil over $6.9 billion a year.

Logging contributes to the economy, however, it is estimated that 80 per cent of Brazilian hardwood is from illegal logging.

Mining provides many jobs, e.g. the Carajas complex provides up to 3000 jobs.

Indigenous people lose their traditional farming and hunting lands.

Environmental Impacts

Deforestation of the Amazon could release 100 billion tonnes of carbon, resulting in increased atmospheric CO2 and global warming.

Deforestation means there area fewer trees to absorb CO2 from the atmosphere, resulting in global warming.

Mining releases dangerous toxins into the soil and rivers.

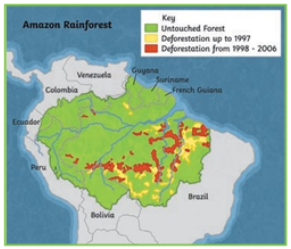
80 per cent of land animals live in tropical rainforest ecosystems, so deforestation will reduce earth's biodiversity.

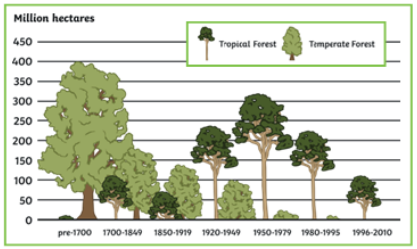
Removing tree cover will leave soil exposed to heavy rainfall causing soil erosion. Soya bean farming alone is responsible for the loss of 55 million tonnes of topsoil each year in Brazil.

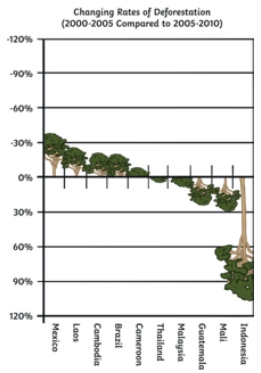
Deforestation could affect the water cycle, causing changes to weather patterns.

6. RATES OF DEFORESTATION

Deforestation of tropical rainforests has been an issue for over 50 years and is still occurring. However, the overall rate of global deforestation in the tropical rainforests is slowing down (e.g. Brazil's rate of deforestation decreased by 21% in 2005-2010 compared to 2000-2005). Unfortunately, some countries still have an increasing rate of deforestation (eg Indonesia's rate of deforestation increased by 107% in 2005-2010 compared to 2000-2005).







7. SUSTAINABLE MANAGEMENT OF THE TROPICAL RAINFOR-

- E**ducation**

Indigenous people can be made more aware of the impacts of deforestation and encouraged to alter their activities.

- **Afforestation (replanting trees)**

Logging companies must replant two trees for each tree cut down .

- **Reducing Debt**

Peru's national debt was reduced by $25 million for their promise to conserve the rainforest.

- **Forest reserves**

Biodiversity and indigenous people's terretories are protected against deforestation in areas designated as forest reserves by the Government.

- **International Agreements**

International agreements to try and reduce illegal logging and encourage sustainable management . For example the Forest Stewardship Council identify timber which has come from sustainably managed forests.

- Selective Logging

Logging companies should select and only cut down certain trees (for example: Mahogany) and leave the other trees standing.

Companies also use 'horse logging' or 'helicopter logging'. This is where they use horses or helicopter to remove the trees which have been cut down. This reduces the amount of damage to the rainforest.

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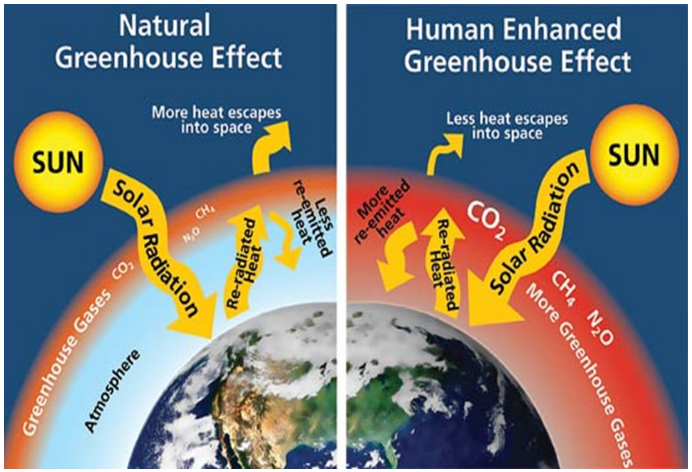
8. KEY VOCABULARY

Climate	The average weather conditions over a long period of time .
Climate change	A change in global or regional climate patterns
Global warming	The gradual increase in the overall temperature of the earth's atmosphere
Fossil fuels	A natural fuel such as coal or gas formed from the remains of organisms that lived long ago
Greenhouse gases	Gases in the air that trap energy from the sun e.g. carbon dioxide and methane
Greenhouse effect	Warming of the earth caused by the trapping of the sun's energy by greenhouse gases creating a blanket around the Earth
Atmosphere	The mixture of gases that surrounds the earth

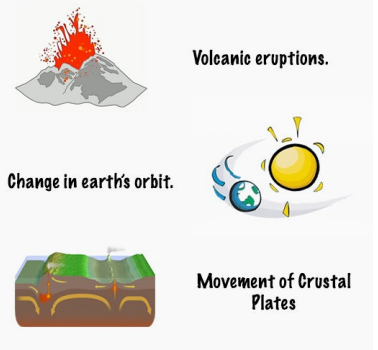


9. NATURAL CAUSES OF CLIMATE

Solar Output	A sunspot is dark patch on the sun that appears from time to time. Every 11 years the number of sunspots changes from very few to lots to very few again. Lots of sunspots = warmer Very few sunspots = cooler
Volcanic Activity	Violent volcanic eruptions blast lots of ash, gases (e.g. sulphur dioxide) and liquids into the atmosphere. Major volcanic eruptions lead to a brief period of global cooling. This is because the ash, gases and liquids can block out the sun's rays, reducing the temperature. Pinatubo 1991 eruption = world temperatures fell by 0.5°C for a year.
Orbital Change	Orbital change means how the earth moves round the sun. It affects how close the earth is to the sun and therefore how much energy we get from the sun. When the earth is very close to the sun, it is warmer. When the earth is further away from the sun, it is cooler. • Eccentricity: how the earth orbits the sun. Every 100,000 years the orbit changes from circular to elliptical (egg-shaped).

10. EFFECTS OF CLIMATE CHANGE

- Sea level rise leading to increased coastal flooding
- Increased extreme weather
- Habitats lost due to extreme weather
- Drought leading to issues producing crops
- Increased desertification due to dryer weather. (arid land turning into desert).



11. HOW DO HUMANS CAUSE CLIMATE CHANGE

Methane Humans are to blame because….	Cows produce a methane when they fart, belch and poo. Methane is a greenhouse gas that traps longwave radiation in the earth's atmosphere. The world's population is rising and countries are becoming more developed = rising demand for meat = more animals farmed = more methane produced.
Carbon dioxide Humans are to blame because…	carbon dioxide is the greenhouse gas that people are most worried about, as it is the one we are adding to the atmosphere fastest. Fossil fuels are burnt to make energy = carbon dioxide is released into the atmosphere. Humans drive cars, which release fossil fuels into the atmosphere Rising population and more developed countries = increased demand for electricity = more carbon dioxide produced.