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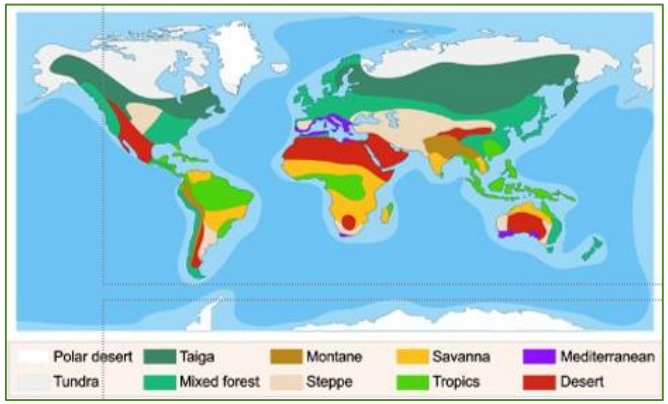
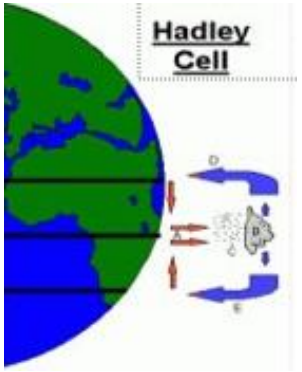
DISTRIBUTION



Climate explained



A. As you would expect, temperatures at the equator are highest. Warm air rises containing evaporated moisture
B. The air cools, condenses and forms clouds
C. Heavy equatorial rainfall occurs (like in the rainforest)
D. The cool, dry air then begins descending. The air warms up. Any remaining moisture in the air is held as water vapour (invisible)

Because the tropics are largely cloudless they get very hot during the day. There are few clouds to insulate these areas during the night. Therefore, temperatures drop to very low levels overnight.

Distribution described

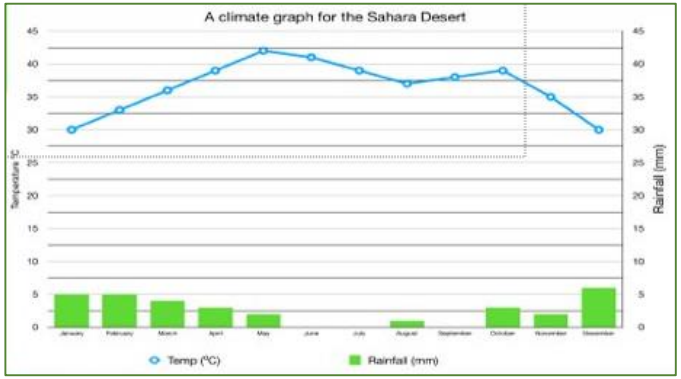
Deserts are mainly found around the Tropics of Cancer and Capricorn, between 15° and 30° north and south of the equator. The main temperate deserts are found in the middle latitudes. Deserts are found in North Africa, central Australia and towards the south west of the USA. Deserts are often found on the west coast of continents.

Distribution explained

Hot air rises at the equator, where the land receives the greatest amount of the sun's radiation. Most of the world's deserts are located near 30 degrees north latitude and 30 degrees south latitude, where the heated equatorial air begins to descend. The descending air is dense and begins to warm again, evaporating large amounts of water from the land surface. The resulting climate is very dry.
Other deserts are located in the rain shadows of mountain ranges. As moist air passes over a mountain range, it expands and cools, precipitating most of its moisture as it rises. As it sweeps down the other side of the mountain range, it warms and compresses, causing high evaporation rates and shedding little rain. Many of the deserts in the south western United States are the result of rain shadows.
A few deserts, such as the Gobi Desert in China, are simply a result of being located far from the Ocean, from which most atmospheric moisture is drawn. The moisture is precipitated before it can reach these interior areas.
Deserts can form even on tropical coasts beside cold ocean currents, such as the west coast of South America. The currents cool the air, which then rises and warms as it moves over land, drawing up moisture that is later precipitated as the air moves further inland.

Climate

Deserts have extreme temperatures. During the day the temperature may reach 50°C, when at night it may fall to below 0°C. This means the desert has a high diurnal range (difference between the highest and lowest temperature within a day).



Deserts have less than 250mm of rainfall per year. The rain can be unreliable. Several years can pass between rainfall events.

Year 9 – Geography / Desert – HT1 & 2

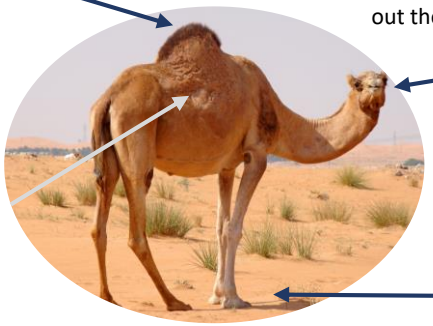
Soil

Desert soils are thin, sandy, rocky and generally grey in colour. Desert soils are very dry. When it does rain they soak up the water very quickly. The surface of the soil may appear crusty. This is due to the lack of rainfall. As it is so hot water is drawn up to the surface of the soil be evaporation. As the water evaporates, salts are left behind on the surface of the soil. Soils are generally infertile due to the lack of litter.

Animal adaptions

Fat is stored in the hump of the camel. This provides energy in times of food shortage in the desert. They don't store water in their humps!

Camels have two rows of eyelashes which are long, and slit-like nostrils which help keep out the sand being blown around the desert



Thick fur on the top of the body for shade, and thin fur elsewhere to allow easy heat loss in high desert temperatures

Large padded feet which allow them to spread their weight on the sand

The desert fox is nocturnal. It also sleeps underground during the day when temperatures are high and comes out at night when its is cooler and more comfortable

The desert fox has large ears which allow it to radiate body heat and help keep cool in the hot desert environment

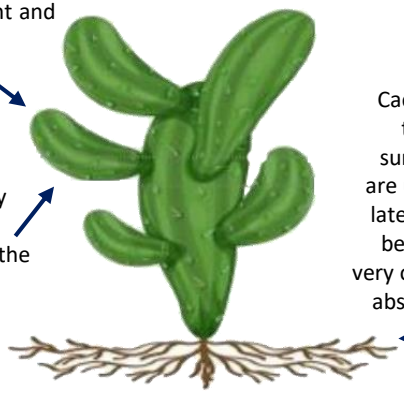
The fox's feet are effective shovels for frequent digging – fennec foxes live in underground dens

The fox's feet are hairy, which help them perform as snowshoes and protect them from the extremely hot sand

Vegetation adaptions

Cacti are succulent plants, meaning they store water. They need to store water as rainfall is infrequent and unreliable

Cacti have needles which helps to reduce moisture loss and deters animals from eating the plant

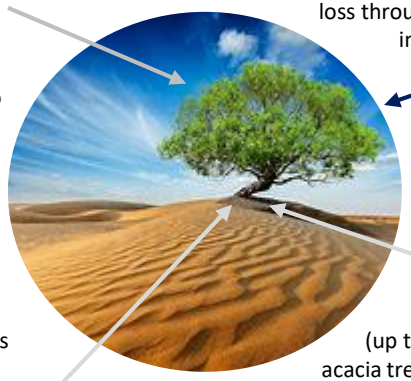


The surface has a waxy coating which reduces water loss and avoids the plant drying out

Cacti have shallow roots that sit just below the surface of the earth and are up to 1m wide (heavy lateral branching). This is because it does not rain very often so the roots can absorb as much water as possible

The large umbrella-shaped crown enables the tree to capture the maximum amount of sunlight, with the smallest leaves. Its also provides shade for the soil below which helps reduce evaporation

Small leaves reduce water loss through transpiration in the hot climate



Acacia trees have developed short, fat trunks that act as reservoirs for excess water. This enables them to thrive during periods of no rainfall

Deep roots (up to 50m) allow the acacia tree to reach water deep underground enabling them to survive drought conditions

Year 9 – Geography / Desert – HT1 & 2

WHAT IS CLIMATE?

- Climate is the average weather in a place. It tells us what the weather is usually like.
- Climate is worked out by taking weather measurements over a long period of time (usually 30 years) and then calculating the average i.e. of temperature and rainfall.
- Weather is what you get on a day-to-day basis!

WHAT IS CLIMATE CHANGE?

A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels!

EVIDENCE FOR CLIMATE CHANGE

ANALYSIS OF POLLEN AND TREES

Allows us to see if more or less pollination has taken place. More pollen would suggest a warmer climate as there would be more pollen and less pollen would indicate the opposite.

WEATHER RECORDINGS

Thermometers are more accurate now and digital readings can be recorded remotely. This means you can easily tell if the climate has changed as you can compare different dates at different times.

ICE CORES

Locked inside ice are molecules and trapped air, which are preserved year on year with more snowfall. Subtle changes in temperature can be measured from ice cores extracted in Antarctica. These can be used to tell the climate from millions of years ago.

ROCKS AND FOSSILS

These can be studied for information covering longer time periods E.g. limestone would have been formed on the bottom of a warm seabed millions of years ago. Telling us what climate was like when first created.

NATURAL CAUSES OF CLIMATE CHANGE

ORBITAL THEORY

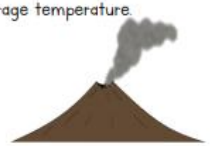
- The Earth's orbit is sometimes circular, and sometimes more of an ellipse (oval)
- The Earth's axis tilts. Sometimes it is more upright, and sometimes more on its side.
- The Earth's axis wobbles, like a spinning top about to fall over.

SUNSPOT THEORY

- The Sun's output is not constant. Cycles have been detected that reduce or increase the amount of solar energy.
- Temperatures are greatest when there are plenty of sunspots – because it means other areas of the Sun are working even harder!

THE ERUPTION THEORY

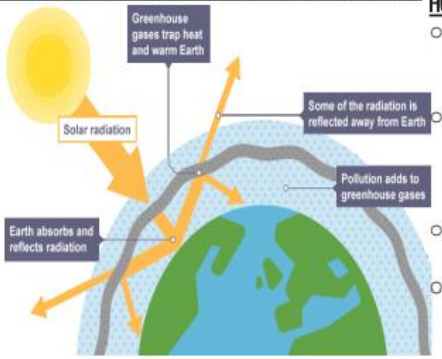
- Volcanic eruptions produce ash and sulphur dioxide gas. This is circulated globally by high level winds.
- The blanket of ash and gas will stop some sunlight reaching the Earth'.
- Instead, the sunlight is reflected off the ash/gas, back into space.
- This cools the planet and lowers the average temperature.



HUMAN CAUSES OF CLIMATE CHANGE

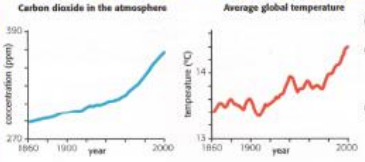
THE GREENHOUSE EFFECCT

- A natural function of the Earth's atmosphere is to keep in some of the heat that is lost from the Earth.
- The atmosphere allows the heat from the Sun (short-wave radiation) to pass through to heat the Earth's surface.
- The Earth's surface then gives off heat (long-wave radiation).
- This heat is trapped by **greenhouse gases** (eg methane, carbon dioxide and nitrous oxide), which radiate the heat back towards Earth.
- This process heats up the Earth.



HUMAN FACTORS INCREASING WARMING

- Burning fossil fuels, eg coal, gas and oil - these release carbon dioxide into the atmosphere.
- Deforestation - trees absorb carbon dioxide during photosynthesis. If they are cut down, there will be higher amounts of carbon dioxide in the atmosphere.
- Dumping waste in landfill - when the waste decomposes it produces methane.
- Agriculture - agricultural practices lead to the release of nitrogen oxides into the atmosphere.



- Carbon dioxide (CO_2) is a greenhouse gas.
- As technology has developed and the population on earth has increased, the amount of CO_2 has increased since 1860.
- Data clearly shows that although temperatures have fluctuated since 1960, the general pattern is that global temperatures have increased as CO_2 levels rise

Year 9 – Geography / Climate Change – HT1 & 2

IMPACTS OF CLIMATE CHANGE

UK

- Crops such as oranges, grapes and peaches can be grown in the UK
- Winter heating costs will be reduced as winters will be milder
- Accidents on the roads in winter will be less likely to occur
- Sea levels could rise, covering low lying areas, in particular east England
- Scottish ski resorts may have to close due to lack of snow
- Droughts and floods become more likely as extreme weather increases
- Increased demand for water in hotter summers puts pressure on water supplies

WORLDWIDE

- Energy consumption may decrease due to a warmer climate
- Longer growing season for agriculture
- Frozen regions such as Canada may be able to grow crops
- Sea level rise will affect 80 million people
- tropical storms will increase in magnitude (strength)
- Species in affected areas (eg Arctic) may become extinct
- Diseases such as malaria increase, an additional 280 million people may be affected

But the negative impacts of climate change will significantly outweigh the positives.

ADAPTING TO CLIMATE CHANGE

Adaptation strategies do not aim to reduce or stop global warming. Instead they aim to respond to climate change by limiting its negative effects. Strategies include:

- **AGRICULTURE** - farmers will have to adapt as some crops may not be able to grow in a warmer climate. However, other crops (eg. oranges and grapes) will be able to be planted.

- **WATER SUPPLY** - water transfer schemes could be used. This is where water is transferred from an area of water surplus to an area of water shortage.

- **REDUCING RISK FROM SEA LEVEL RISE** - areas at risk from sea level rise may use sea defences to protect the land from being eroded away.

CLIMATE CHANGE ACTIVISM

Climate change activism and protests have increased in recent years. Below are some examples of action that is being taken to combat climate change.

- **Raising awareness:** sharing learning about the human impact of climate change with others.
- **Campaigning:** asking decision makers to do what they can to reduce greenhouse gas emissions and support communities to adapt to climate change.
- **Going green:** individuals, schools and communities taking action to reduce their own emissions.
- **Fundraising:** raising money for charities working against climate change.

ADAPTATION VS MITIGATION

MITIGATION

This involves reducing greenhouse gas emissions and increasing the sinks for these gases. This can be done by setting targets to reduce emissions, switching to renewable energy sources and carbon capture and storage.

ADAPTATION

This involves changing lifestyles to cope with the consequences of climate change. This includes managed retreat from eroding coastlines, the development of drought-resistant crops and the extension of conservation zones to enable the migration of species.

MITIGATING TO CLIMATE CHANGE

Mitigation means to reduce or prevent the effects of something from happening.

Mitigation strategies include:

- **ALTERNATIVE ENERGY** - using alternative energy such as solar, wind or tidal can reduce the use of fossil fuels. This will reduce the amount of carbon dioxide released into the atmosphere.

- **CARBON CAPTURE** - this is the removal of carbon dioxide from waste gases from power stations and then storing it in old oil and gas fields or coal mines underground. This reduces the amount of emissions into the atmosphere.

- **PLANTING TREES** - encouraging **afforestation**, means that there will be more trees to absorb the carbon dioxide in the atmosphere during the process of photosynthesis.

- **INTERNATIONAL AGREEMENTS** - in 2005 the Kyoto Protocol became international law. The countries that signed up to the treaty pledged to reduce their carbon emissions by 5 per cent. However, this ran out in 2012 and its overall impact has been small. The US refused to join and major developing countries like China and India were not required to make any reductions.

AN INCONVENIENT TRUTH

An Inconvenient Truth is a 2006 American concert/documentary film directed by Davis Guggenheim about former United States Vice President Al Gore's campaign to educate people about global warming. The film features a slide show that, by Gore's own estimate, he has presented over a thousand times to audiences worldwide.

BEFORE THE FLOOD

Before The Flood is the product of an incredible three-year journey that took place with my co-creator and director Fisher Stevens. We went to every corner of the globe to document the devastating impacts of climate change and questioned humanity's ability to reverse what may be the most catastrophic problem mankind has ever faced.

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World Mountain Ranges

1. Himalayas (South East Asia-Nepal, China, Tibet)-home to Mt Everest-located at the border between India and Nepal-largest mountain in the world (above sea level) -8,848m
2. Alps- spreads across 8 countries in middle of Europe (France, Monaco, Italy, Switzerland, Liechtenstein, Austria, Germany, Slovenia)- Mt Blanc is the highest mountain in the alps- 4808m (above sea level)
3. Andes Mountains (western edge of South America-Venezuela, Chile, Ecuador, Peru, and Bolivia)- Its various landscape contains glaciers, volcanoes, grassland, desert, lakes and forest.
4. Rocky Mountains (western North America-Canada and New Mexico)
5. Appalachians (eastern North America)
6. Atlas Mountains (north western Africa- spanning across Morocco, Algeria and Tunisia)
7. Ural Mountains (eastern Europe- western Russia)

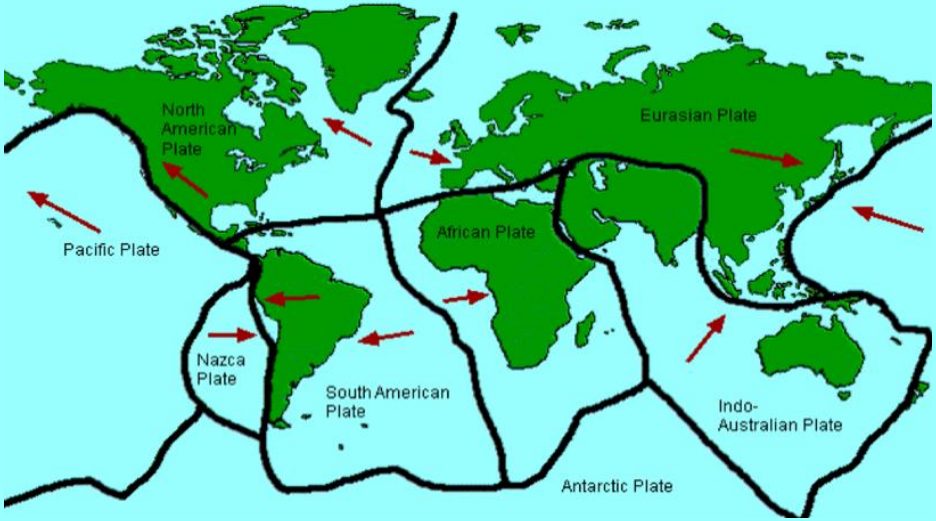
Watch [The Worlds 10 Deadliest Mountains]

8. Zagros Mountains (western Asia-Middle East- spans across Iran, Iraq and south eastern Turkey
9. Great Dividing Range (East of Australia)

UK Mountains

CLICK HERE TO EXPLORE

Ben Nevis
Scotland-highest mountain in Britain –1344m
Mount Snowdon
Highest mountain in Wales- 1085m
Scafell Pike
Highest mountain in England- 978m



Formation of Mountains:
Mountains are located near the boundaries of **plate tectonics**.

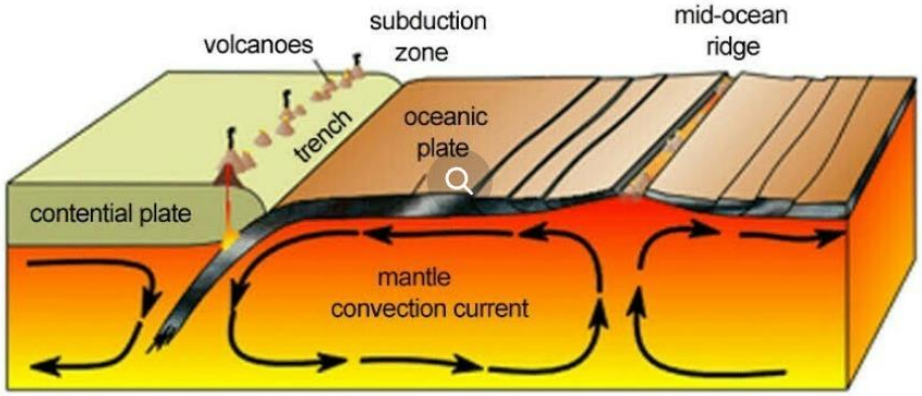
They form at **destructive and collision plate boundaries**, which is where two plates move towards each other.

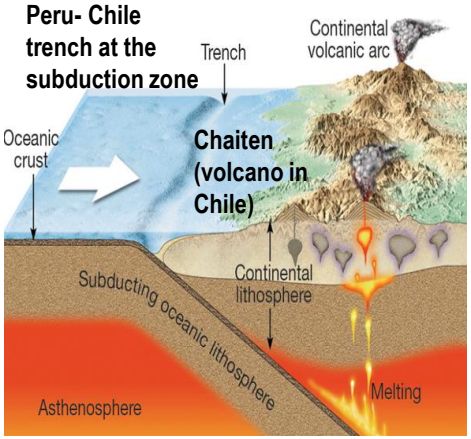
Year 9 – Geography / Mountainous Regions – HT1 & 2

RECAP: What are plate tectonics?

WATCH VIDEO

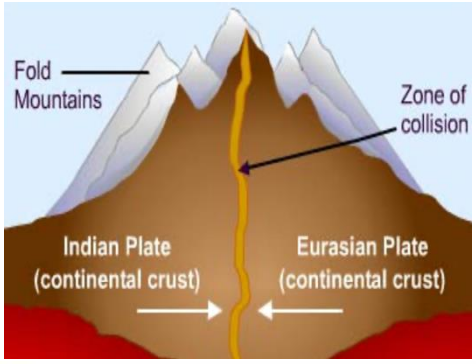
- The Earth's **crust** (top layer), which has a varied thickness, is made up of seven large **tectonic plates** and numerous other smaller plates.
- The plates can either be '**light' continental plates** or '**heavy' oceanic plates.**
- The plates are sections of the **crust** that "float" on the **mantle,** which is made up of **molten rock** (semi-liquid, "gooey caramel" **magma)**.
- The plates move due to the circulation of intense heat (**convection currents**) within the **mantle**.





Formation of the Andes (3)
The best example of a **destructive plate boundary** is found when the **Nazca plate** is **subducted** and melted underneath the **South American plate** to form the Andes.

DESTRUCTIVE PLATE BOUNDARY *(Oceanic and Continental plate colliding)*
As they crush together, the **densest (heavy) oceanic plate,** is pushed and melted underneath **(subducted)** the least dense (lightest) **continental tectonic plate**. **Volcanoes** are found here (e.g.: **Chaiten, in Chile**) as crust is melted into magma and rises again in an eruption.
WATCH HOW THE ANDES FORMED



Formation of the Himalayas: Mt Everest (1)
WATCH HOW THE HIMALYAS FORMED 80 MILLION YEARS IN THE SPACE OF 2 MINUTES!

The best example of a **collision plate boundary** is found where the **Indo-Australian plate** collides and folds with the **Eurasian plate** to form the Himalayas. The **Himalayas** continue to rise by 1cm a year at the rate at which fingernails grow.

COLLISION PLATE BOUNDARY
Where two **equally dense continental plates collide, crumple up together and fold** at the **collision zone**. As no crust is subducted or melted to make molten magma, there is **no volcanic activity.**

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Mount Everest

Land use and recreational (leisure) activities:

All mountainous regions attract lots of tourists both regionally and internationally. People visit Mt Everest specifically because of its bucket list appeal; it's significant 'world's highest mountain' status and because it offers the most challenging but adrenaline thrill seeking experiences. Leisure activities consist of skiing, climbing, mountain-biking and hiking. Also, skydiving over the top of Mt Everest is one of the top 10 skydiving places in the world!

Explore variously priced expeditions and tours and try to resist planning or booking a trip!

At lower altitudes the land is used for grazing livestock and arable farming. Precipitation draining into water streams on Mt Everest's slopes provides the main water source flowing through many Asian countries, such as the huge population living in Kathmandu, which is the capital city of Nepal.

The impacts of tourism:

Nepal is a developing country dependent on farming as their main source of income. Tourism to capital city Kathmandu accounts for 10 percent of its GDP'. Tourism is growing; it has increased by 50-60% since the 1990s;
number of **tourists** who visit the **Everest** region each year is around 35000.

Positive impacts:	Negative impacts:
• Economic opportunities- profits from tourist expenditures improve existing services such as roads, healthcare and education facilities • increased employment opportunities (e.g.: tour guides, restaurant's, expedition providers) • Encourages local craftsmanship (sentimental souvenirs) • rise in standards of living • Visitors meet local people, experience another culture, and learn to respect cultural traditions and the environment • Efforts and empathy to support the least developed regions. Visitors are able to return home, share experiences and encourage support and aid efforts at times of crisis (e.g. Nepal earthquake 2015)	• Working in the tourist industry often low paid and seasonal (not a reliable source of income) • Waste disposal issues e.g. oxygen cylinders, human faeces and at least 200 dead bodies! Himalayas in danger of becoming a giant rubbish dump • Leads to potential risk of water contamination affecting water sources for many Asian countries. • Visitors walking erode pathways, degrade designated trials • Disturb wildlife and destroy plants • increased pressure on local services and resources • Can Kathmandu cope with extra tourists when for the past 10 years it struggles to provide bathing or washing water to hotels? Water shortages have plagued Kathmandu for years • road congestion and air pollution • deforestation- timber from trees for building and space needs clearing of trees for new developments to support growth of tourism (e.g.: need another airport, road bypass or hotels) • Deforestation can lead to increased risk of landslides and flooding; trees act as a natural flood defence. • Loss of culture identity among mountain people as they are increasingly exposed to different cultures

Did you know?
SURVIVAL TIP:
if you get caught up in an avalanche, spit and gravity will inform you which direction to frantically start digging!

Location of Mt Everest
Tallest 'land' mountain in the world (8848m high): situated in South East Asia, in Nepal, which is between India and China.

Did you know?
The first recorded person to climb Mt Everest was a New Zealand Mountaineer, Edmund Hillary, in 1953.

Year 9 – Geography / Mountainous Regions – HT1 & 2

Flora (plants):

Himalayan vegetation varies according to both altitude and climatic conditions.

- Deciduous forests in the foothills.
- Temperate forests in the middle altitudes.
- Coniferous alpine forests in higher altitudes due to their ability to grow fast in the short summers and cope in extremely cold conditions.

These forests finally give way to alpine grasslands and high-altitude meadows (low lying shrubs due to short growing seasons and windy conditions). Followed by scrublands (rocky with little vegetation) which finally lead up to the permanent snowline.

Fauna (animals):

The Himalayan Mountains contains a diverse range of habitats and provides home to many endangered species such as the Snow Leopard, Red Panda and Musk Dear.

WATCH: What animals can you see?

Animal adaptations- Snow leopards

The snow leopard lives high in the Himalayas of central Asia. They are adapted to extreme cold temperatures as low as-32°C and extremely high altitudes. Because of their shy behaviour and uncanny, almost mystical ability to disappear among the rocks, snow leopards have entered the folklore of local peoples in many countries and have been described as shape-changing mountain spirits or the ghost cat of the Himalayas! Resultantly, they are extremely difficult to radio tag and track for research purposes.

Most active at night, snow leopards are powerful predators capable of killing prey two to three times their own weight every 10 to 15 days. Blue sheep and ibex are their main food, along with marmots, game birds, small rodents, and livestock.

Problems arise in the winter, when marmots are hibernating, and snow leopards turn to livestock for food. This brings them into conflict with herders and farmers. This puts snow leopards in direct competition with people.

The International Union for Conservation of Nature has classified this large cat as 'vulnerable', which means that the snow leopard is at high risk of becoming extinct. This is because the global population is less than 10,000; there are only 3400-4500 left in the wild across 12 countries, and this number is expected to decrease again by 10% by 2040. A total of 32 threats to their survival ()have been identified, the main threats are: starvation due to prey reductions; illegal poaching; as well as habitat destruction and disturbances due to human activities, infrastructure developments and climate change.

WATCH VIDEO: How do they survive in these extreme conditions? AND Why are they at risk of extinction?

- Deep nasal cavities and chest hold larger volumes of oxygen deprived air. Nose has special passages to warm cold air before entering lungs
- Small ears to reduce heat loss in cold climates
- Long thick tail for jumping balance and blanketing around body for warmth
- Long-distance eyesight for hunting prey
- Long underbelly fur for warmth in extreme cold
- Fur colours camouflage with rocks and snow

Natural Hazards:

Avalanches

A mass of snow, ice, and rocks falling rapidly down a mountain.
They can be caused by heavy Snowfall, increased temperatures, movements or vibrations produced by machinery, explosives or 'yodelling', and earthquakes

The 2015, 7.8 magnitude Nepal Earthquake, caused an avalanche which buried base camps on the slopes with snow. Resultantly, 19 deaths were recorded with many people still missing. Survivors were rescued by helicopter

WATCH THE DISASTER

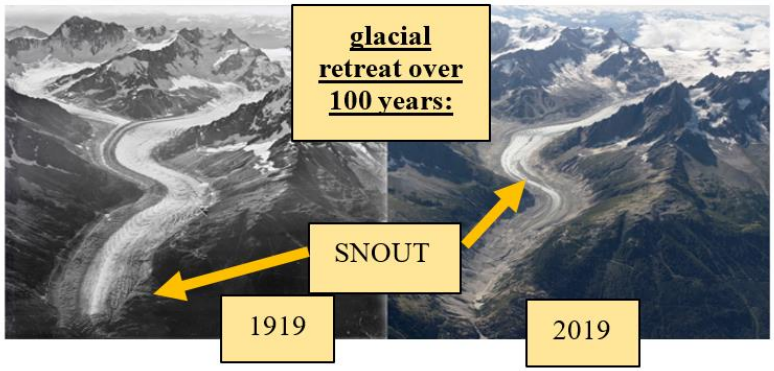
Altitude

Perhaps the biggest danger is the altitude. Most climbers are not accustomed to the high altitude and low oxygen levels and rely on oxygen canisters they bring along. This is why the area above 8,000 meters (26,000 feet) elevation on Everest is called the "death zone." Climbers who spend long periods in this region can develop altitude sickness. As popularity of the climb has increased, ques of climbers has made this zone even more deadlier with "traffic jams" , a deadly inconvenience

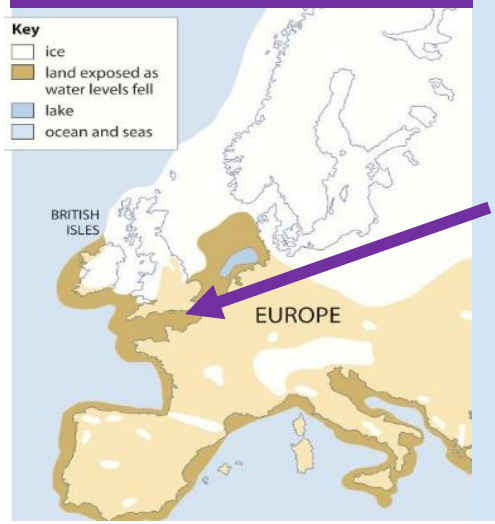
The Death Zone:

Climate change:

- Since 1919, global temperatures have increased by 1°C ().
- This has caused the glacier tops of Mt Everest to melt at an increasing rate; this process is known as glacial retreat.
- The melt water creates a flood risk; Nepal's army had to drain the Imja Lake near Mount Everest in 2016 after its water from rapid glacial-melt had reached dangerous levels.
- Melting ice reduces the mountains ability to reflect the sun's rays. This consequentially traps more heat into the atmosphere and the increasing exposure of rocks, increases the amount of solar heat absorbed.
- DISTURBING NEWS: Melting glaciers are exposing dead bodies ()that were buried in the snow. (March 2019 BBC News)



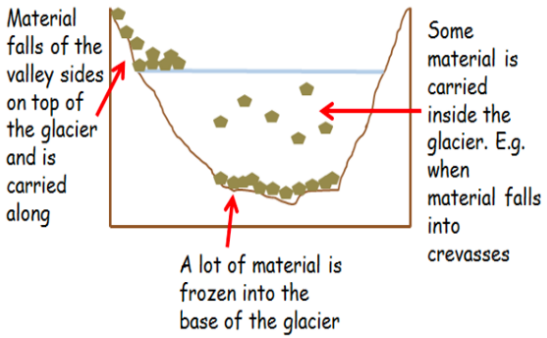
The Last Ice Age



Ice ages are extremely cold periods, in which **glaciers,** which are slow moving rivers of ice made out of compact snow and **ice sheets** covered the majority of the land. In northern Europe and most of the British Isles, Ice did not melt until 10,000 years ago.

The English Channel used not to exist!
Since the sea level was lower than the present day (refer to orange shaded areas), due to the water being stored as snow or ice sheets, the **British Isles** was connected to the land mass of Europe and the **English Channel** did not exist! This **'land bridge'** was responsible for plant and animal species moving from France or other parts of Europe to England on foot. such as the woolly Mammoth, migrating and living in Southern Britain's tundra region.

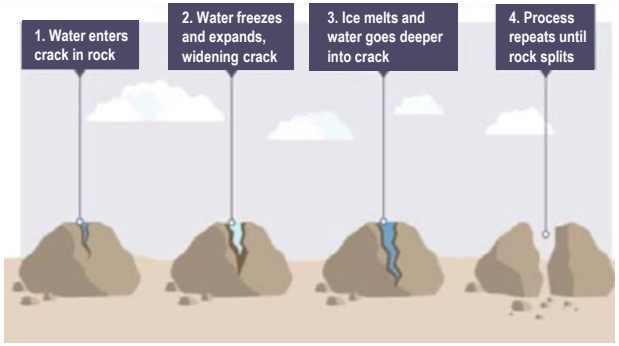
Glacial processes: TRANSPORTATION



As the glacier moves forward it pushes loose debris ahead of it effectively transporting it downhill; this process is called **bulldozing.**

Glacial Processes

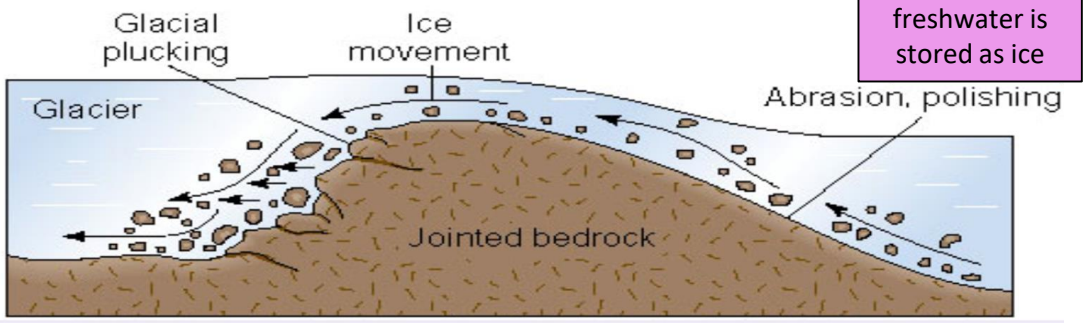
Freeze-Thaw Weathering
Water gets into cracks in the rocks. The water **freezes** and expands, putting **pressure** on the rock. The ice then **thaws**, **releasing** the **pressure**. The process **repeats** itself **many times** until the rock **shatters** and **breaks apart**.



Plucking
Melt water underneath, on the back or sides of the glacier **freezes onto the rock**. As the **glacier moves** forward it **pulls** pieces of rock out.

Abrasion
Bits of **rock stuck in the glacier grind** against the rock below the glacier, **wearing it away** – a bit like **sandpapering**.

Did you know?
75% World's freshwater is stored as ice



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Glacier Landscapes in the UK

Keyword	Definition
Ice age	A time period when ice advances from the north and south poles towards the equator, with global sea levels at a low due to water locked up as land-based ice. Ice ages last for hundreds of thousands of years.
Ice sheet	A large, expansive body of ice, 1-2 miles thick which covers a land surface, covering continental areas.
Tundra	Permanently frozen bedrock and soil found at the fringes of the glacial areas. Today, Alaska, Canada and Siberia are tundra covered areas.
Glacier	A frozen land-based river like feature, flowing from the upland areas down towards the low-lying coastal areas. Formed through the accumulation of snow turning into ice over hundreds of thousands of years.
Abrasion	A type of glacial erosion, when the ice wears away the bedrock using the rock and pebbles being carried in the base of the glacier. It is often referred to as the sandpaper effect.
Plucking	A type of glacial erosion. When the base of glaciers freezes onto bedrock and pulls up large pieces of bedrock as it flows over the land surface.
Freeze-thaw weathering	The action of water flowing into cracks, freezing as ice (when temperatures drop or an ice age sets in), and widening the cracks so much that rock breaks apart. It is also known as frost-shattering and slowly breaks the rock apart.
Moraine	Material that has been transported (moved/ carried) and deposited by the glacier.

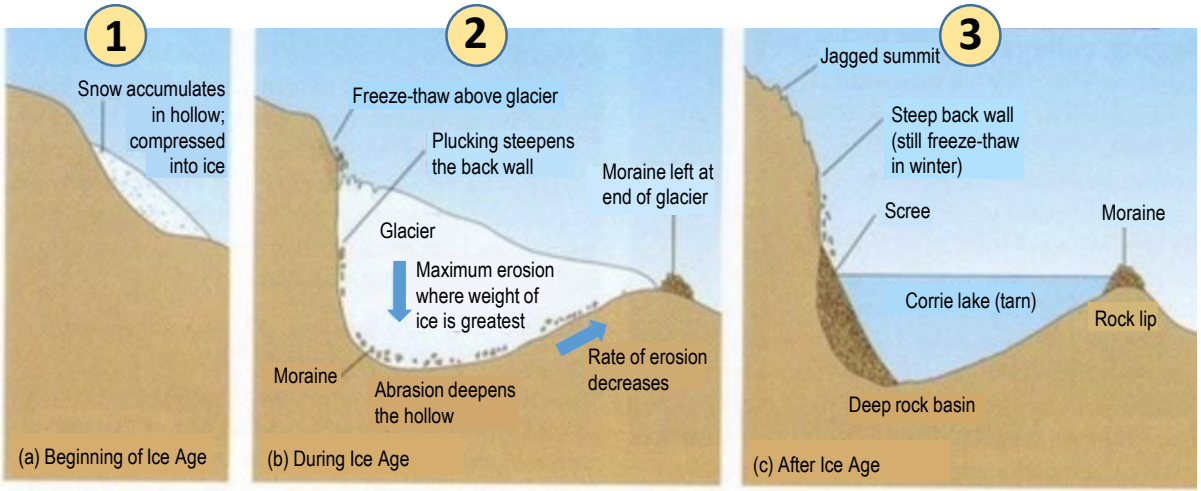
Glacial erosion landform: CORRIES

Corrie formation:

A corrie begins as a sheltered hollow, where snow builds up year after year.

1. The snow **compacts** to ice. When the ice is thick enough, it starts to **flow downhill** due to gravity. It is now a glacier! First, meltwater lubricates its downhill flow into the hollow
2. Through **plucking and abrasion** the hollow grows deeper and the walls steeper. Freeze-thaw weathering helps.
   Eventually the glacier is big enough to flow over the curved edge of the corrie, this is called rotational slip. The glacier will then continue its journey down the mountain.
3. Once the glacier melts, the corrie is revealed. It may have a lake within, these lakes are called **tarns**.

Example of a tarn in a corrie
Cwn Cau
Snowdonia National Park, Wales



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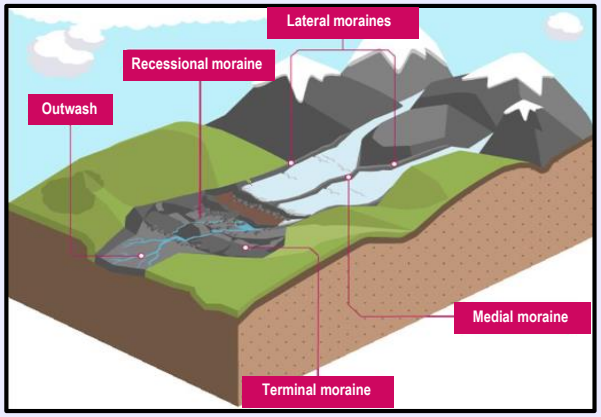
Glacier Landscapes in the UK

Glacial processes: Deposition and depositional landforms

Material that has been carried and deposited by the glacier is called **moraine**

Different types of moraine (deposited sediment)

- **Terminal moraines** are found at the snout or (end) point reached by a glacier.
- **Lateral moraines** are found deposited along the sides of the glacier.
- **Medial moraines** are found at the junction between two glaciers.
- **Ground moraines** are disorganised piles of rocks of various shapes and sizes



Deposition occurs when the ice melts. As most melting occurs at the front (the snout) of a glacier, this is where most deposition takes place.
As a glacier slowly retreats it leaves behind a bed of broken rock fragments called till (or moraine). Due to the lack of water to transport it, till is poorly sorted, with jagged rock fragments of all sizes.

Ahead of the glacier, meltwater rivers will carry sediments away. The process of attrition (rocks knocking into each other) will cause the rock fragments to become smaller and more rounded. Sediment will be well sorted, with larger rocks deposited close to the ice and finer material carried many kilometres away.

How can people use the land in a glaciated area?

Quarries and Mining

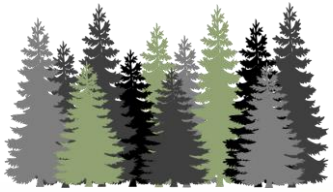
✓ Erosion by glaciers exposes lots of rock, making it easy to get to. Glacial landscapes are often quarried for slate, granite and limestone

× Quarrying damages habitats. The noise of blasting and trucks can scare the wildlife and spoil the peacefulness of the area. Large scars from quarrying may also put tourists off visiting as the area won't look attractive. This could mean loss of income for local businesses such as hotels and restaurants

Forestry

✓ Coniferous (evergreen) forests are often planted in upland areas because these trees can cope with the cold weather and high rainfall. The trees are used for timber for building materials and paper

× When the trees are chopped down for timber this scares off wildlife and damages habitats



Farming

✓ It's usually too cold to grow crops, but grass is grown to make hay to feed the sheep and cows

✓ Cattle are kept on the flatter, valley floors

✓ Sheep farming is common in the upland glaciated areas because the steep slopes and poor soils make it unsuitable for any other type of farming

Tourism

✓ Glaciated areas have dramatic landscapes, making them attractive places to visit. Popular activities in these areas include; hiking, climbing, boating, mountain biking and skiing

× Tourist developments such as hotels and attractions may spoil the natural scenery. For example there is a visitor centre on the top of Mount Snowdon in North Wales

× Large visitor numbers of tourists can damage stone walls, scare sheep, leave gates open and drop litter. Some farmers don't want lots of tourists walking on their land. They may try to block footpaths by putting up fences

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Impacts of tourism can be good and bad

- ✓ Tourism offers employment to local people who work in hotels, shops, cafes and other services. However these jobs are often only during peak months and are low paid
- ✓ Tourism keeps local services going. Local buses and shops would have closed down if it wasn't for the tourists. Locals are able to make use of these facilities. However, something these facilities are closed in the winter months when tourist numbers are low
- × Increased traffic causes problems as the country lanes are often narrow and winding. Congestion is common and there isn't enough car parking available. Lack of car parking spaces mean tourists often park on the side of the roads on grass verges. This damages vegetation
- ✓ However developing facilities such as car parks can increase income from tourism (e.g. car park charges). This can be invested into the area to pay for improvements such as repairing footpaths, planting trees and conserving habitats.

- ❖ U-shaped valleys
- ❖ Glacial valley landforms-glacial trough, truncated spurs, hanging valleys, ribbon lakes
- ❖ Aretes and pyramid peaks
- ❖ Depositional landforms: drumlins and erratics
- ❖ Ice stupas- Himalayan

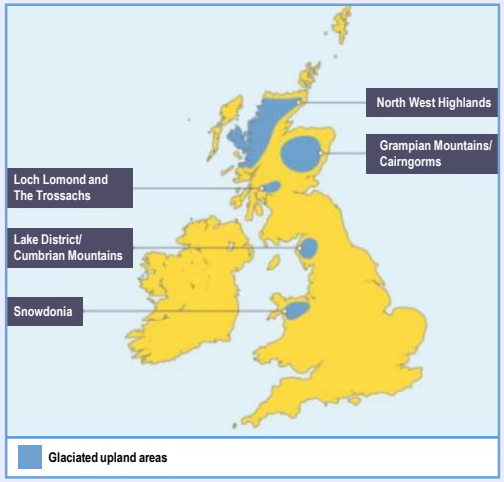
The Lake District

Problems with Tourism

- × The **average price** of a house in the village of Grasmere is over **£350,000**, while the **average household income** is only **£27,000**. Many local people **cannot afford** to stay living in the area
- × An estimated **89%** of visitors to the Lake District **arrive by car**. This makes the **roads very busy**
- × **Businesses** in tourist hotspots like Ambleside **cater mainly for tourists**. About **40% are cafes, restaurants and hotels** and around **10% sell outdoor clothing**
- × **More than 16% of properties** in the Lake District National Park are **second homes or holiday homes**. This means there are **fewer people living in the area in winter**, so some **shops and services close down** for several months

Strategies to Manage the Problems

- ✓ **Zoning schemes** mean that some water sports are only allowed in some lakes. **Lake Windermere** has a **10 knot speed limit** for all boats. This **keeps areas peaceful** for people to enjoy
- ✓ In **2012**, planning permission was granted for **134 affordable homes** and **141 houses** that **only local people are allowed to buy** – they cannot be used as holiday homes or lets



➢ The Lake District gets **16.4m visitors every year**

➢ Tourism **employed over 16,000 people** in **2014** and **visitors spent over £1 billion**