

Desert [n].

Knowledge Organiser

Distribution.



Polar desert
 Tundra
 Taiga
 Mixed forest
 Montane
 Steppe
 Savanna
 Tropics
 Mediterranean
 Desert

Climate explained.



Hadley Cell

- As you would expect, temperatures at the equator are highest. Warm air rises containing evaporated moisture.
- The air cools, condenses and forms clouds.
- Heavy equatorial rainfall occurs (like in the rainforest!).
- 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.

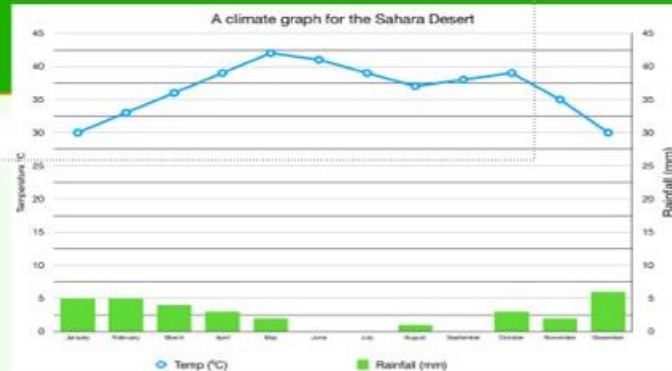
Other deserts are located in the rain shadows of mountain ranges. As moist air passes over a mountain range, it expands and cools, precipitating most of its moisture as it rises. As it sweeps down the other side of the mountain range, it warms and compresses, causing high evaporation rates and shedding little rain. Many of the deserts in the southwestern 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 farther 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 250 mm of rainfall per year. The rain can be unreliable. Several years can pass between rainfall events.



1.



The World's Oceans are very important.

Pacific Ocean
This is the biggest ocean on earth and covers more than 30% of the earth's surface. The size of this ocean is bigger than the total size of all the continents together. It's northern edge is surrounded by the ring of fire – an area containing 75% of the world's active volcanoes.

Atlantic Ocean
This is the world's second largest ocean and covers 25% of the Earth's surface – around 6.5 times the size of the USA. This ocean has very important trade routes between Europe and USA.

Indian Ocean
This is the third largest ocean, making up around 20% of the earth's surface. This ocean connects the oil-rich countries of the Middle East with Asia. Many countries on the shores of this ocean are popular with tourists.

Southern Ocean
This is the fourth largest ocean, making up around 6% of the earth's surface. It is also known as the Antarctic Ocean, South Polar Ocean or Austral Ocean. Icebergs will be encountered in this Ocean during any season, but during May to October there are also strong winds which make crossing the ocean even more dangerous. This Ocean is home to the emperor penguins and wandering albatrosses, blue whales and fur seals. Every spring over 100 million birds nest on the rocky shores of Antarctica.

Arctic Ocean
This is the smallest ocean, covering around 3% of the earth's surface. Much of the ocean is covered by ice, however the thickness of the ice varies depending on the season. Due to global warming, large parts of this ocean now melt in spring and summer and refreeze during the winter. This Ocean is home to whales, walrus, polar bears and seals.

Year 9 Marine Pollution

2.

Causes of Pollution

8 million tonnes of plastic are dumped into the oceans every year. Cigarette butts, plastic bags, fishing gear, and food and beverage containers are the most common forms of plastic pollution found in the oceans.

Plastic does not disappear in the ocean, sometimes it breaks down into tiny fragments and is eaten by fish. This may start low down the food chain, eg **plankton eat tiny pieces of plastic, shrimp eat plankton, larger fish eat shrimp** – by the time humans eat the eat there can be high levels of plastic. Larger pieces of plastic may choke, strangle or suffocate marine life.

Transportation of oil by ships and pipes along with associated accidents are responsible for **12% of oil pollution at sea**. Oil may seep from cracks in pipes deep below the ocean surface.

Land-based activities are the major source **of oil pollution, and account for 37% of it**. This occurs when oil is used to make energy, or as fuels in vehicles. Leaks from cars and during repair all ultimately end up in the ocean. Even when you pour oil down the sink in your home, it can end up causing ocean pollution.

Many ships dump their rubbish **while out at sea. Though ocean liners make up only 1% of the ships, they produce 25% of the waste from ships**. This is domestic, cooking, operational, and sewage wastes. Cruise ships dump a considerable amount of sewage into the ocean. It is estimated that 95,000 cubic metres of sewage from toilets and 5,420,000 cubic metres of sewage from sinks, galleys and showers are released into the oceans each day.

3.

Impacts of pollution

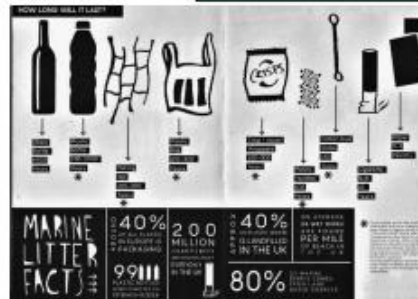
- Plastic is the most common element that is found in the ocean. It is harmful for the environment as it does not get break down easily and is often considered as food by marine animals.
- Over one million seabirds are killed by ocean pollution each year.
- Three hundred thousand dolphins and porpoises die each year as a result of becoming entangled in discarded fishing nets, among other items.
- One hundred thousand sea mammals are killed in the ocean by pollution each year.
- There is an island of garbage twice the size of Texas inside the Pacific Ocean: the North Pacific Gyre off the coast of California is the largest oceanic garbage site in the entire world. There, the number of floating plastic pieces outnumbers total marine life six to one in the immediate vicinity.

4.

Responses to Marine Pollution can be:

- Individual – one person at a time
- Group – groups in local areas
- National – usually put in place by Governments
- Global – many Governments or large groups can work together

All are needed to tackle this problem.



Watch: The Worlds 10 Deadliest Mountains.
How can mountains be dangerous?



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 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](#)



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.

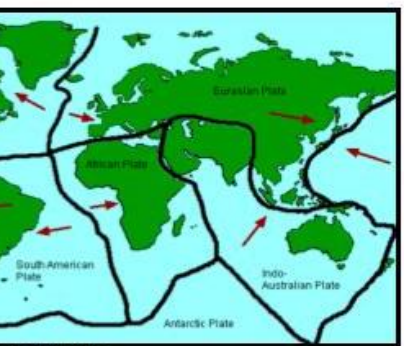


MOUNTAINOUS REGIONS

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

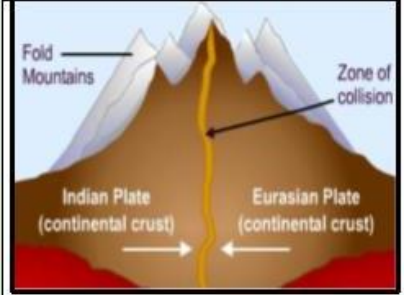
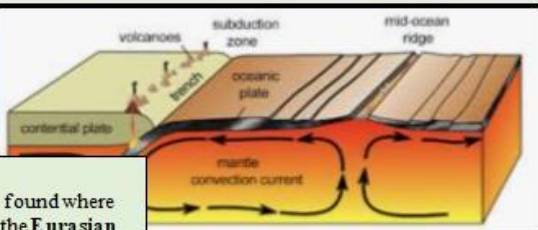
Formation of the Himalayas: Mt Everest (1)
The best example of a collision plate boundary is found where the Indo-Australian plate collides and folds with the Eurasian plate to form the Himalayas.
The Himalayas continue to rise by 1cm a year at the rate at which fingernails grow.
[WATCH HOW THE HIMALAYAS FORMED](#)- 80 MILLION YEARS IN THE SPACE OF 2 MINUTES.

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.



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.

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.



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 didn't used 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 in 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 Mammouth, migrating and living in Southern Britain's tundra region.

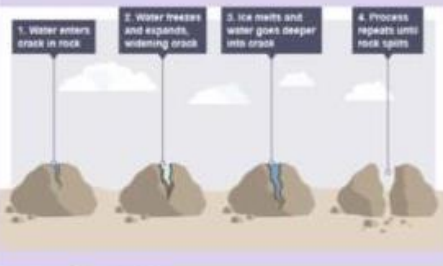
Glacial erosion landform: CORRIES

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.

Glacial processes: EROSION

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.

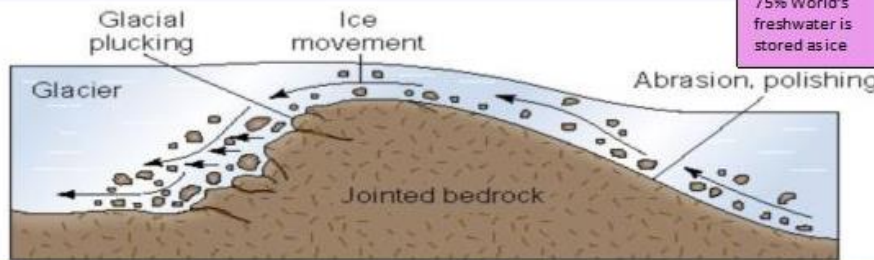


Plucking

Melt water underneath, on the back or the 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.

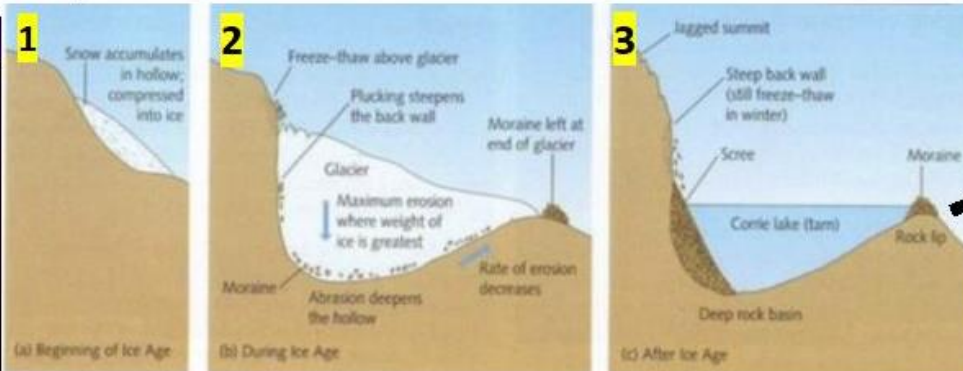
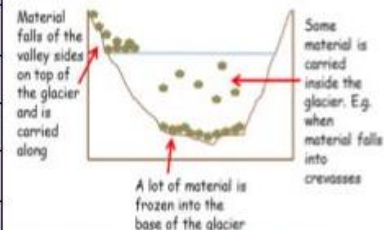


Did you know?
75% World's freshwater is stored as ice

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 processes: TRANSPORTATION

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



EXAMPLE OF A TARN IN A CORRIE:
CWN CAU, SNOWDONIA NATIONAL PARK, WALES

Glacier Landscapes in the UK