

1. What is weather and climate? - Climate is average conditions over 30 years. - Weather is the day to day conditions. - Climate has fluctuated over time but has began to rise more sharply since the 1900s. - A cause is a reason why something happens where as an impact is what happens as a result.	2. Evidence of climate change Tree rings – wider rings represent more favourable conditions for growth (warmer, wetter). Ice cores – Scientists look at the CO₂ concentration in the bubbles to gauge past temperature (higher = warmer) Historical records – detailed information about the weather, but are subjective so less reliable. Glacial retreat -
3. The greenhouse effect - It is a natural process. - Greenhouse gases include carbon dioxide, methane and water vapour. - The sun's energy radiates down to Earth. - Earth absorbs some of the energy, and reflects some. - When the Earth releases some of this energy, it is trapped. - The Earth heats up.	4. Human causes of climate change Human activities are increasing greenhouse gases in the atmosphere, causing the Earth to warm. The main causes are: Burning fossil fuels – releases large amounts of CO₂ from coal, oil and gas. Deforestation – reduces the number of trees absorbing CO₂. Agriculture – produces methane from livestock and nitrous oxide from fertilisers. Industry and transport – release greenhouse gases through manufacturing, energy use and burning fuel.
5. Natural causes of climate change Climate fluctuates due to: Orbital changes: if Earth's orbit is more elliptical we can be further from the sun – cooler. Axial tilt – this can make the poles cooler, and sometime the Earth wobbles – these are called Milankovitch cycles. Eruption theory: Volcanoes eject ash into the atmosphere, blocking the sun's energy – cooling. Sunspot theory – sometimes the Sun emits more or less energy.	6. Deforestation Trees absorb 16 billion tonnes of carbon each year through photosynthesis. They release CO₂ from the atmosphere and return oxygen, helping to balance the climate. Removing trees stops this process, and burning trees releases the CO₂ back into the atmosphere. We are currently losing 10.9 million hectares of forest each year.
7. Energy Historically, we burned fossil fuels like coal to generate electricity, warming the climate significantly during the 1900s (industrial revolution). We are now shifting towards clean energy & renewables like solar, wind and nuclear. Globally, 80% of energy still comes from fossil fuels. In the UK, electricity is generated by 34% fossil fuels, but when you account for heating and transport this rises to 78%.	8. Carbon footprints A carbon footprint is the total amount of greenhouse gases, mainly carbon dioxide (CO₂), produced by a person, organisation, product or activity. It includes emissions from things such as transport, energy use, food production and manufacturing. A larger carbon footprint contributes more to climate change.
9. Melting ice Polar ice is melting rapidly and the rate is increasing. Between the 1990s and 2010s, ice loss from Greenland and Antarctica increased around sixfold. Current estimates show Antarctica loses about 135 billion tonnes of ice per year, while Greenland loses about 264 billion tonnes per year. Melting land ice adds water to the oceans, causing sea levels to rise. This increases the risk of coastal flooding, erosion and damage to settlements and ecosystems.	10. The Maldives The Maldives is extremely vulnerable to sea level rise because over 80% of its land is less than 1 metre above sea level. Rising seas can cause coastal flooding, beach erosion and loss of land, while saltwater can contaminate freshwater supplies. This threatens homes, infrastructure, tourism and livelihoods, and could eventually make some islands uninhabitable.

11. Drought in Africa	12. Desertification
13. Tropical storms	14. Wildfires
15. Impacts on the ocean	16. Inequalities in climate change
17. Renewable energy	18. How else can we reduce climate change?
19. International Approach	

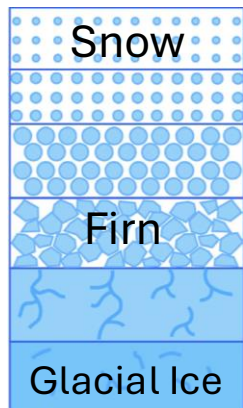
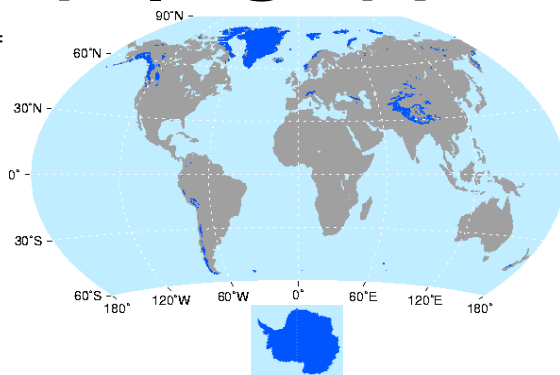
GLACIATION



Until about 10,000 years ago, the north of the UK was covered in a large ice sheet.

Now there are only glaciated environments at high ALTITUDE and high LATITUDE.

Glaciation has impacted the landscapes throughout the North.



Layers of snow build up and get compacted under the weight, forming glacial ice.

Important key words

Ablation	Where the ice that melts is more than the ice that is gained (near the snout of the glacier)
Accumulation	Where the ice that is gained is more than the ice that melts (near the top of the glacier)
Altitude	Height of the land above sea level
Latitude	Distance from the equator
Glacial period	Periods of low temperatures
Interglacial period	Periods of warmer temperatures
Alpine glacier	Form on mountains and move downslope in valleys
Continental ice sheet	Form on continents and spread over large areas e.g. Greenland.

Types of Erosion

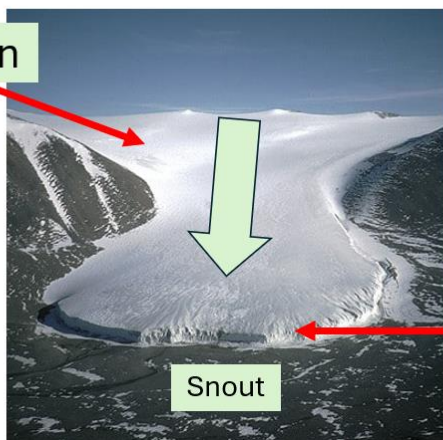
Freeze – thaw	Water gets into cracks in rocks, freezes, and expands. This weakens the rock and will eventually break down the rock into smaller pieces.
Plucking	Happens at the base of the glacier, meltwater at ground level re-freezes around rocks, then as the glacier moves the rocks are pulled from the mountain.
Abrasion	As the glacier carries the rocks it has picked up, the rocks grind and act like sandpaper to erode the valley.

Snow

Accumulation

Avalanches

Glaciers move due to the force of GRAVITY.



Alpine

Evaporation

Ablation

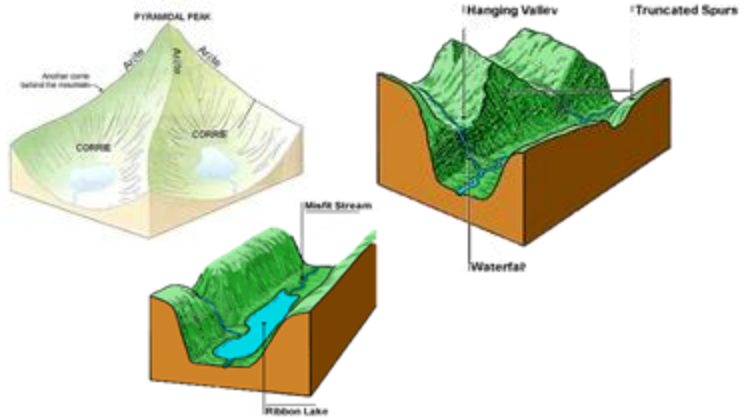
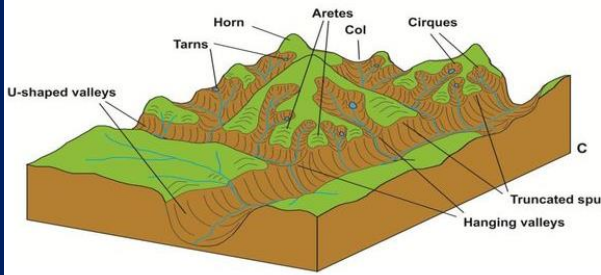
Melting



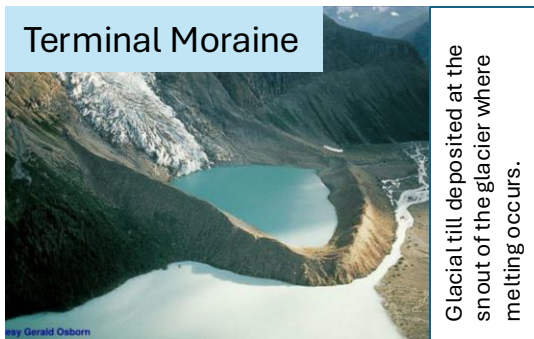
Continental

GLACIATION

Erosional Landforms



Depositional Landforms



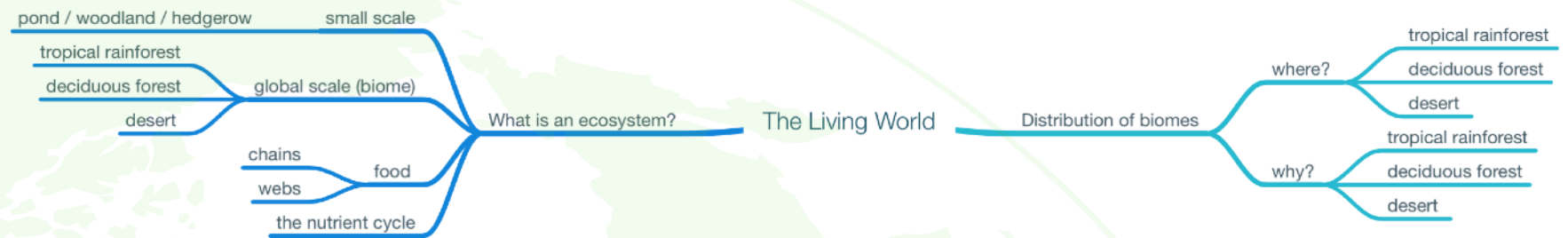
What are glaciers used for?

- Fresh water
- Hydroelectricity
- Tourism



Ecosystems [n].

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Ecosystems and biomes.

An **ecosystem** is an environment in which a community of plants and animals (**biotic**) that share an environment with non-living things (**abiotic**) such as soil.

- Climate is the weather in an area over a long period of time.
- The plants and animals within ecosystems adapt so that they

are able to survive in that area.

- Ecosystems are not one size: they can be as small as a hedgerow or as large as a rainforest.

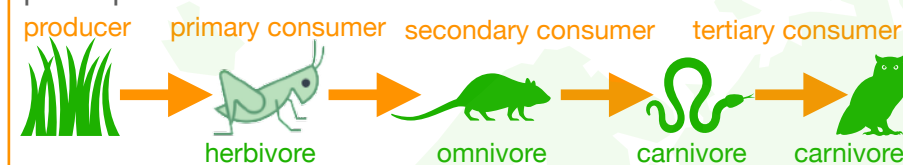
- Large ecosystems are called **biomes**.

Examples of biomes include:

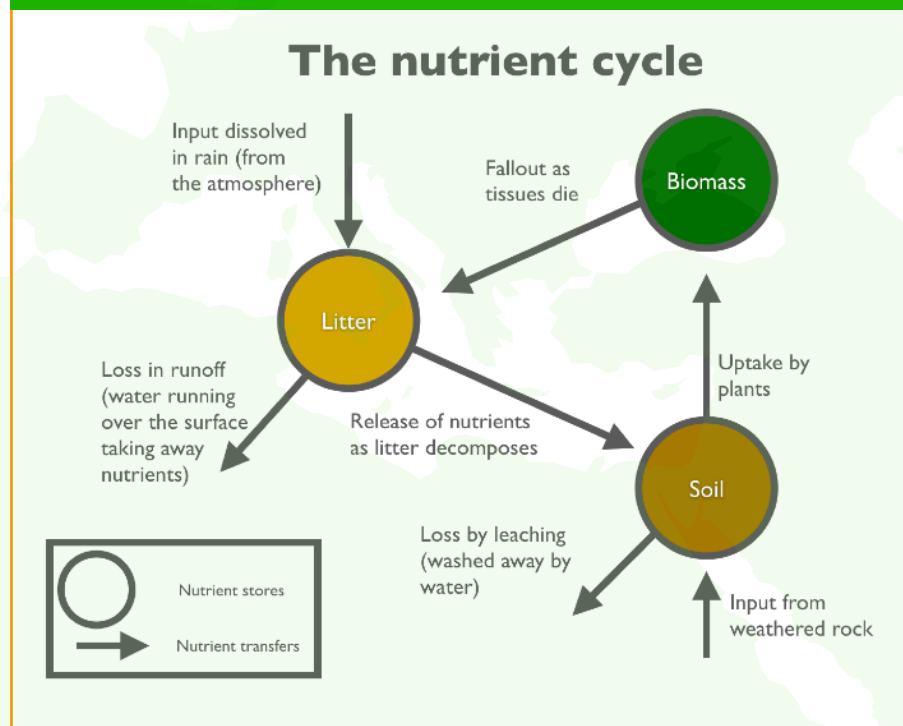
- tundra (cold desert)
- tropical rainforest
- hot desert

Food webs and chains.

A **food chain** only follows one path as animals find food. eg: A hawk eats a snake, which has eaten a frog, which has eaten a grasshopper, which has eaten grass. A **food web** consists of many food chains. It shows the many different paths plants and animals are connected.



The nutrient cycle.



Energy flows.

Organisms within an ecosystem can be classed as producers, consumers or decomposers. Energy flows through these organisms within the ecosystem.

Producers, such as a trees, produce their own food and begin this cycle. Using energy from the sun they produce food. They do this by photosynthesis. Most producers are plants, but there are some small organisms that produce food through photosynthesis as well.

The producers are eaten by primary consumers that cannot produce their own food, such as a giraffe. Primary consumers are herbivores which means they only eat plants. Secondary consumers are carnivores such as lions. In a simple food chain secondary consumers eat primary consumers.

Decomposers break down dead plants and animals. They also break down the waste of other organisms. Examples of decomposers include bacteria and fungi. Decomposers get their energy from breaking down dead material e.g. dead producers, dead consumers or fallen leaves. When dead material is decomposed nutrients are released into the soil. These nutrients are then taken up from the soil by plants. Decomposers are very important for any ecosystem. If they weren't in the ecosystem the plants would not get essential nutrients and dead matter and waste would gather.

Tertiary Consumers:

Secondary Consumers:

Primary Consumers:

Primary Producers:

ferns moss flowers fruit trees grass deciduous trees

Simple Food Web

Keywords.

ecosystem, biotic, abiotic, biomes, habitat, food chain, nutrient cycle, food web, consumers, biomass, decomposers, herbivore, omnivore, carnivore.

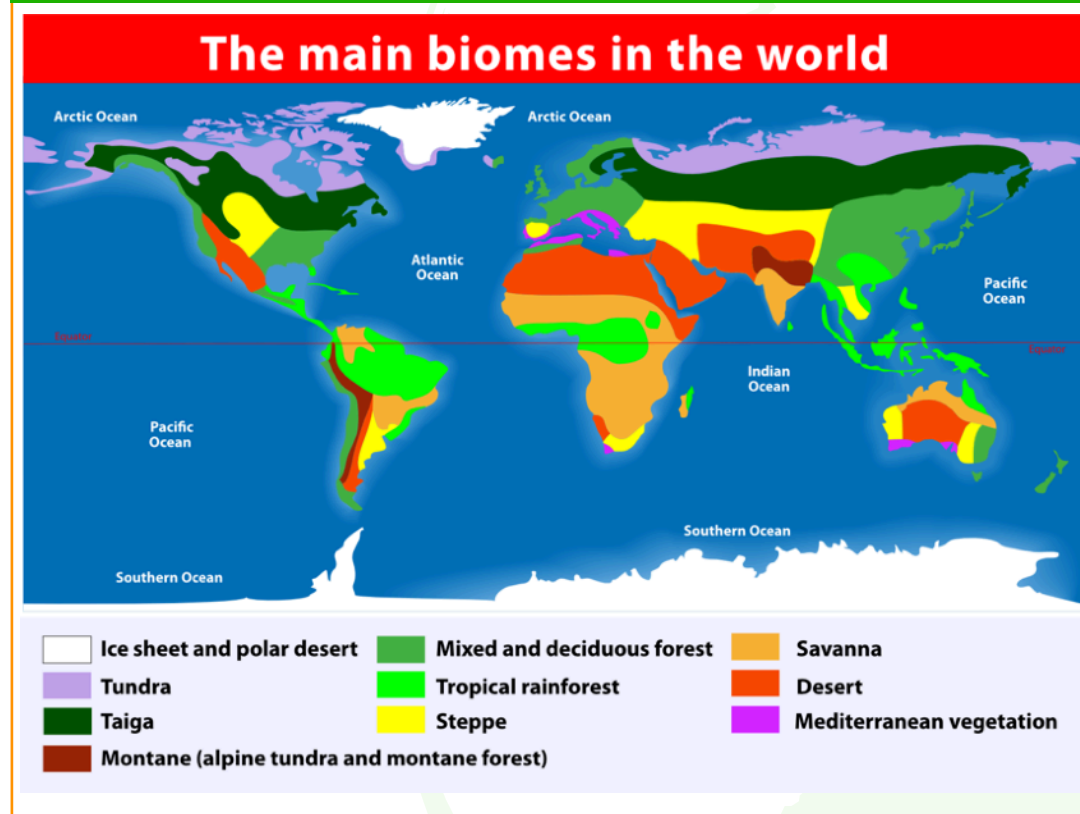


Ecosystems [n].

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Distribution.



Distribution described.

Tropical rainforests are located between 10° north and south of the equator where temperatures stay near 80 degrees all year round. Rainforests receive 160 to 400 inches (400-1000 cm) of rain each year. The largest rainforests are in Brazil (South America), Zaire (Africa) and Indonesia (South East Asia). Other tropical rainforest places are in Hawaii and the islands of the Pacific & Caribbean.

Temperate deciduous forests are common in the mid-latitudes. Temperate deciduous woodlands are found between 40° and 60° north and south of the equator. They are found in Western Europe and on the Eastern coast of the USA. In these locations the rainfall is high, between 500-1,500 mm a year. The temperatures remain on average above 0°C even in the winter. The summer temperatures average between 20-25°C. The winter is cooler, which encourages the trees to shed their leaves.

Deserts are mainly found around the Tropics of Cancer and Capricorn, between 20° and 35° 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.

Distribution explained.

Tropical Rainforests

The temperatures around the equator are always high, which causes a fast evaporation of water, which rises, cools and condenses and results in frequent rain and a tropical climate. Warm ocean currents tend to move towards areas of tropical rainforest. Also, the warm, moist air that travels above these currents provides rainfall.

Deserts

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.