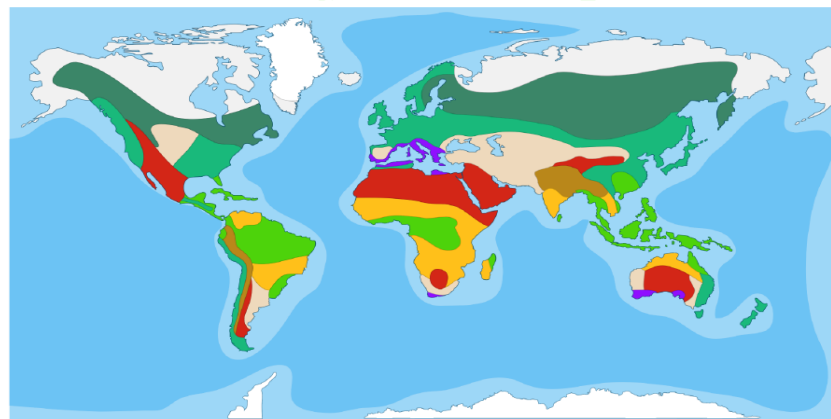


# Desert [n].

## Knowledge Organiser

### Distribution.



### 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.

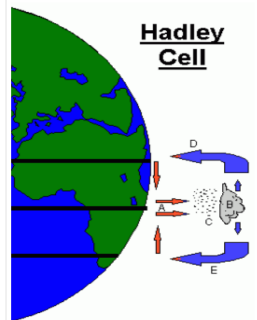
Hot air rises at the equator, where the land receives the greatest amount of the sun's radiation. Most of the world's deserts are located near 30 degrees north latitude and 30 degrees south latitude, where the heated equatorial air begins to descend. The descending air is dense and begins to warm again, 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 explained.



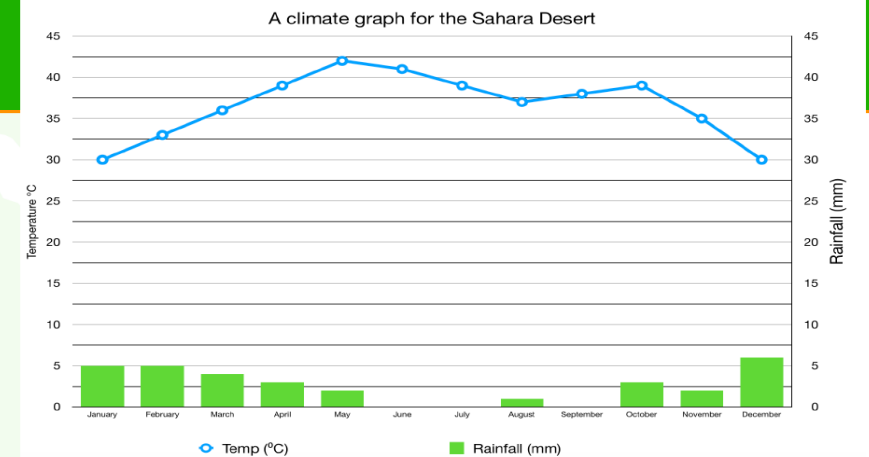
#### Hadley Cell

- 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.

### 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.



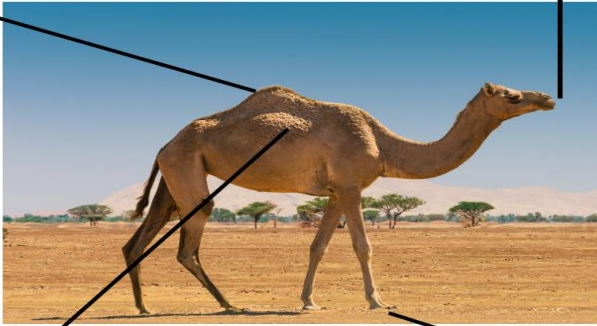
## Soil.

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 by 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 Adaptations.

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 in 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 allows them to spread their weight on the sand.

The desert fox is nocturnal. They sleep underground during the day when temperatures are high and come out at night when temperatures are cooler and more comfortable



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

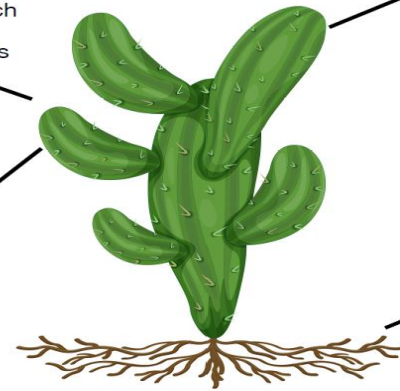
The fox's feet are effective shovels for frequent digging — fennec foxes live in underground dens.

The fox's feet are hairy, which helps them perform like snowshoes and protects them from extremely hot sand.

## Vegetation Adaptations.

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

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



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

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 of leaflets. It 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.