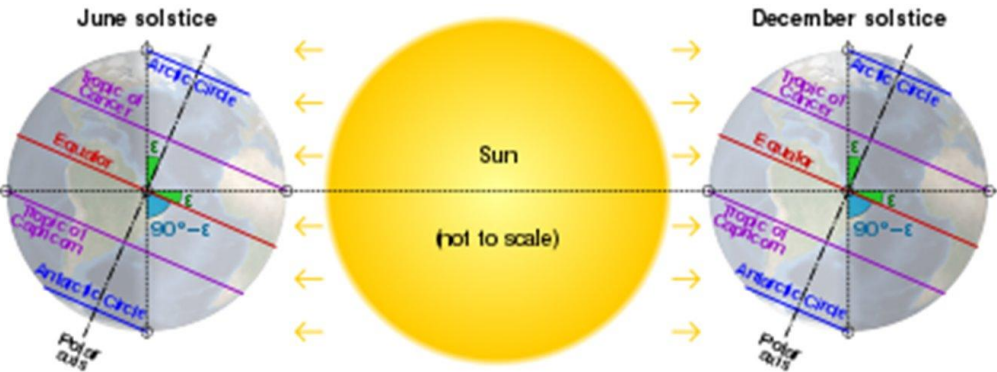


# Year 9 – Cold Environments

Key Terms	
Environment	The surroundings or conditions in which a person, animal or plant lives; the natural world
Polar	Regions near North and South Poles that are permanently frozen.
Tundra	Flat, treeless mostly frozen Arctic regions of Europe, Asia and North America.
Mountainous	Every 100 meters you climb the temperature decreases by 1 degree hence ice.
Adaptation	Living things are adapted to their habitats. This means that they have special features that help them to survive.
Producer	Create the energy to sustain themselves from the sun. E.g. plants
Consumer	These are organisms that eat the producers or other consumers
Threat	Inflicting punishment or harm. For example sea pollution can harm animals.
Extreme environment	A habitat that is considered very hard to survive in due to its considerably extreme conditions such as temperature and lack of food.

## Why are polar regions so cold?

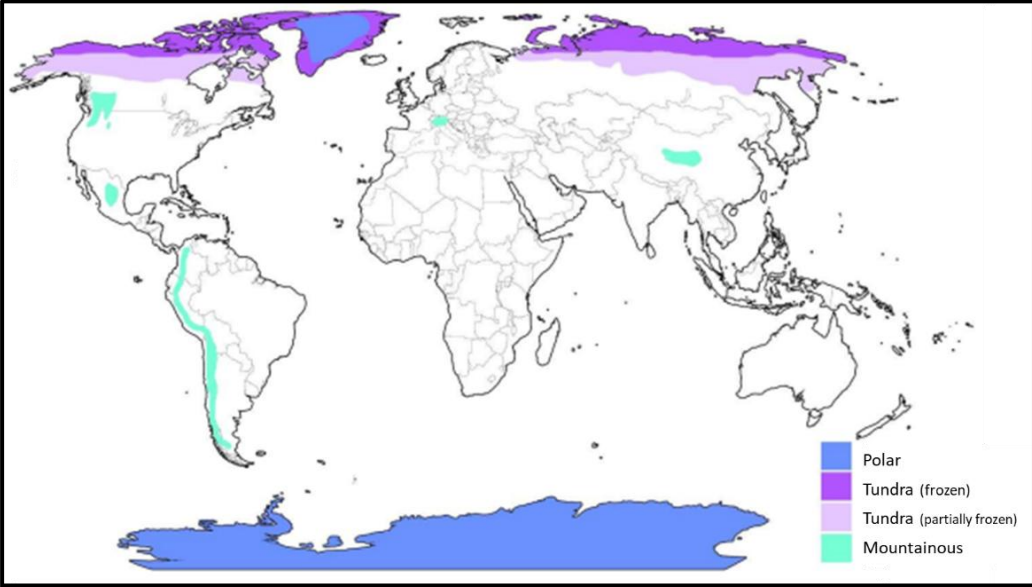


1. The surface of Antarctica has a high albedo effect. This means that a lot of the energy received from the Sun is reflected back into space by the white ice so does not warm up the ground.

2. It is far away from the equator, so the angle of the Sun is low in the sky. This means the energy from the Sun spreads out over a large area.

3. The area has 24 hours of darkness for some of the winter. Therefore, there is no sunlight for long periods of time to warm the surface.

## Location of Cold Environments



**Polar environments** are found in the **Arctic** which is far north and **Antarctica** which is the most southerly point on earth. **Tundra** is mostly found just south of the **Arctic** in Northern Europe, Asia and North America. **Alpine/mountainous** environments are found mostly down the Western side of the Americas and in Europe (the Alps) and Central Asia (The Himalayas).

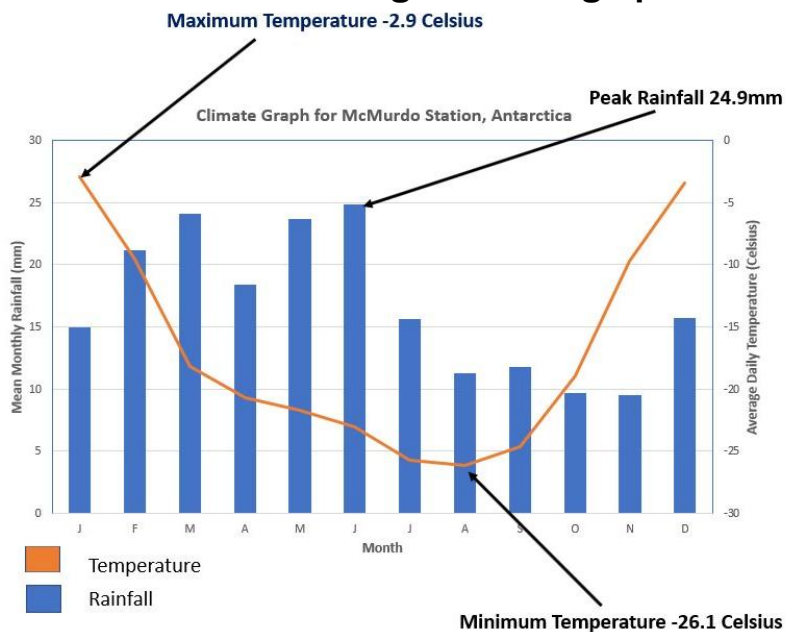
## Polar Bear Adaptations

**Two layers of fur** – air gets trapped between their fur and heats up helping them to stay warm in the freezing Arctic conditions.

**Camouflage** – the white fur helps to keep them hidden in the snow and ice so they can sneak up on prey. They need this because there are not many animals in the Arctic due to the extreme environment.

**Large paws** – the large surface area of their paws helps them to spread the weight so they don't sink into the snow so they use less energy walking long distances looking for prey.

## Reading a climate graph for Antarctica



Blue Bars show precipitation (snow/rain) they show that the McMurdo Research station in Antarctica get more snow from February to June. Peak Precipitation is in June (Antarctica's winter)

The red line shows temperature change across the year. Notice the highest temperature is -2.9 in January which is the Antarctic summer (because its in the southern hemisphere.)

## Threats to Polar Environments



Pollution is a huge issue. There are many minerals in the Arctic that are mined or drilled for which can have negative environmental impacts such as the oil spill caused by a ship above which destroyed vegetation and killed birds and fish.



Both the Arctic and Antarctica are becoming more popular with tourists as wealth increases and people seek adventurous holidays. Environmentalists worry that the disruption to wildlife and damage created by vehicles will have lasting damage.

## People in Cold Environments: Svalbard

Longyearbyen, is the capital of Svalbard, it is tiny with 2,400 residents from almost 53 different countries. The small Arctic town is inhabited by nature enthusiasts who live in tough climatic conditions with the High Arctic wilderness right on their doorstep. The range of services on offer to residents and guests is surprisingly extensive with a wide range of shops, restaurants and bars. In Longyearbyen, the North Pole is right around the corner from the pub.

The residents of Longyearbyen feel that we live completely normal everyday lives. However, those looking from the outside often perceive everyday life as extraordinary. The polar bears are never far away, so it's a necessity to carry weapons. The climate is harsh and unpredictable. Some people find the contrasts and changes between light and dark challenging, while others think it's wonderful.



## Antarctica: A scientists dream

Scientists have been studying Antarctica for over 100 years. Captain Scott's failed attempt at the South Pole took twelve scientists on the ship that took him down to Antarctica. There are now 70 permanent research stations in Antarctica! Some of the biggest research involves:

**Climate Sciences:** Investigating changes in the atmosphere, temperature and sea-ice can help determine how much of the observed change is due to human activity and how much is a result of natural factors.

**Zoologists & wildlife biologists :** Antarctica is a natural laboratory for studying plants and animals. Microbial life, invisible to the naked eye, plays a vital role in Antarctic ecosystems and studying it could unlock new science.