

# 1. What is Antarctica?

- Antarctica is the fifth-largest continent, lying in the southernmost part of the earth.
- It is situated in the Southern Hemisphere and covers the South Pole.
- It is surrounded by the Southern Ocean and covers an area of 14 Million square kilometres.
- It is famous for the Lemaire Channel and Paradise Harbour (Passageways flanked by iceberg), and Port Lockroy (research stations turned into museum).
- Its isolated terrain is home to rich wildlife, including penguins.
- It covers an area of 5.4 million square miles.



## **2. Description of Antarctica**

- Almost whole Antarctica is covered with ice. Only 2% of the Antarctica has no ice.
- The thickness of the ice covering the Antarctica is 1.9 km.
- Antarctica is the coldest, iciest, driest and most windy continent on earth.
- The mean annual precipitation of Antarctica is very low, hence it is also called polar desert.
- There are no permanent residents on Antarctica due to extremely cold weather.
- Antarctica has about 70% of the fresh water of the earth.
- As we move away from the coastal areas on Antarctica, the weather gets colder and drier.
- The inland temperature falls to -100°F or more from May to August.
- It is surrounded by the Southern Ocean (combination of Atlantic, Indian and Pacific oceans)

## **3. Physical Features of Antarctica**

- Antarctica is approximately two times the size of Australia and fifty times the size of UK.
- It is approximately equal to the combined size of USA and Mexico.
- It has a rough circular shape with a long arm extending towards South America.
- The nearest land masses to Antarctica are
  - South America (600 miles away)
  - Australia (1550 miles away)
  - South Africa (2500 miles away)
- The size of Antarctica doubles in winters due to the ice formed around the coasts.
- The actual boundary of Antarctica is the Antarctic convergence.
- It contains almost 90% of the total ice of earth.



#### **4. Geographical Features of Antarctica**

- Antarctica is the largest piece of ice on the surface of Earth.
- The elevation of the Antarctic ice sheet above sea level is 2,000 meters near the sides of the continent, and 4,000 meters near the centre of Antarctica.
- This ice sheet further increases in size when it snows in winter.
- The ice sheet primarily grows at the coastal ice shelves (floating ice sheets connected to the continent), the Ross Ice Shelf and the Ronne Ice Shelf.
- Antarctica has some mountain summits, out of which a few are higher than 4,500 meters.
- Without any ice, Antarctica would convert into an archipelago of mountainous island (Lesser Antarctica) and a large landmass (Greater Antarctica) equivalent to the size of Australia.
- Great Antarctica contains igneous and metamorphic rock.
- Lesser Antarctica contains volcanic and sedimentary rocks.
- Antarctica is the only continent entirely covered with one ice-sheet.
- This ice-sheet is divided into two parts; the East and West Antarctic Ice Sheets. These sheets have different history and physical characteristics.
- Only 0.32% of Antarctica is free of glacier ice.



## **5. Antarctica Landscape**

- Antarctica is divided into two parts:
  1. East Antarctica (Greater Antarctica)
  2. West Antarctica (Lesser Antarctica)

- These two parts are separated by the Transantarctic Mountains.
- These mountains are stretched all around the continent and mostly buried under ice.
- The West Antarctica would be a group of islands if the ice sheets were removed.
- 98% of Antarctica is covered with ice, which contains 70% of the earth's fresh water.
- Antarctica is the highest of the continents due to its thick ice cover.
- The ice sheet is not smooth because it is continuously moving.
- There are two active volcanoes on the continent:
  1. Mount Erebus (3,794 m)
  2. Deception Island
- The highest active volcano on Antarctica is Mount Erebus.
- There are some Dry Valleys located at high altitude areas with extreme aridity.



Mount Erebus with an Emperor Penguin keeping watch.

## 6. Antarctica Pyramid

- A pyramid-shaped mountain has been discovered recently in Antarctica.
- Some professors say it is just a mountain which has the shape of a pyramid by coincidence



Truth or fiction?

What is the truth behind the pyramid mountain?

## **7. Is Antarctica a Country or is it a Continent?**

- Antarctica is not a country, it is a Continent.

- It is managed according to the Antarctic Treaty, signed in 1959.



## **8. How many Countries in Antarctica?**

- There are total 48 countries in Antarctica from around the world.



## 9. How big is Antarctica?

- The area of Antarctica in summer is 14.2 Million square kilometres.
- Its area doubles in size in winter due to the formation of ice around the coasts.
- It is larger than the continents of Australia and Europe.

- It is approximately two times the size of Australia and fifty times the size of UK.
- It is almost 1.5 times the size of USA.

## ANTARCTICA VS AUSTRALIA



### **10. Is Antarctica a Desert? Why is Antarctica a Desert? Antarctic Desert Facts**

- Any region that receives less than 10 inches (254 mm) of annual rainfall or precipitation is classified as a desert.
- Antarctica is considered a desert due to the rarity of moisture falling from the sky.

- The inner regions of Antarctica receive about 2 inches (50 mm) of precipitation per year, in the form of snow. It is lesser than the Sahara Desert.
- The outer regions of Antarctica receive about 8 inches (200 mm) of precipitation per year, which is still lesser than the minimum.



## **11. Do people live in Antarctica?**

- Yes, there are some scientists and research workers who live temporarily in Antarctica.
- There are 70 research stations in Antarctica owned by 30 countries.
- These research stations are manned by scientists and other staff.
- Apart from the people working at the research stations, there are no human beings living on Antarctica.

## 12. What is the population of Antarctica?

- The population of Antarctica varies with climate:
  1. 4000 in Summer
  2. 1000 in Winter
- There are no permanent residents living in Antarctica.



Wordie House Antarctica

## 13. Plants in Antarctica

- Antarctica has absolutely no bushes or trees at all.
- The vegetation in Antarctica is limited to:
  - 350 different species of mostly mosses, lichens and algae.
  - 3 different species of flowering plants.
- Most of this vegetation is found in the northern areas and coastal areas of Antarctica.
- In some areas, red, yellow and orange Lichens have colonized on bare rocks.
- Some algae has been discovered growing inside the rocks due the harsh weather conditions outside.



Antarctic Moss

## 14. What animals live in Antarctica?

- There are two types of vertebrates in Antarctica:
  1. Migratory Vertebrates which leave the continent in winter
  2. Vertebrates dependent on the sea for food
- Thus, the only land animals on Antarctica are invertebrates (Animals with size in millimetres).
- Some of these invertebrates are:
  1. Mites
  2. Ticks
  3. Nematode Worms.
- These invertebrates survive the winters by freezing themselves under the rocks.
- All the bodily functions of the invertebrates are stopped while frozen.

- The bodies of invertebrates have antifreeze which helps them in becoming active again in summers.
- The oceans surrounding the Antarctica are bustling with animals. Some of the animals depending on the oceans are:
  1. Whales feeding on marine life (mostly Krill)
  2. 6 species of Seals
  3. 12 species of birds
- The most famous bird of Antarctica is the Penguin.
- The most famous predator on Antarctica is the Leopard Seal. It hunts penguins and fish.



Humped Back Whale



Orca and Leopard seal



Crabeater Seals in the Lemaire Channel, Antarctica



Emperor Penguins

### Antarctic Animals list

- The vertebrates living on/around Antarctica are:
  - Penguins
    1. Emperor Penguins
    2. King Penguins
    3. Adélie Penguins
  - Seals
    1. Weddel Seal
    2. Crab-eater Seal

- 3. Leopard Seal
  - Birds
- 1. Wandering Albatross
- 2. Snow Petrel
- 3. Antarctic Skua
  - Whales
- The invertebrates living on Antarctica are:
  - 1. Nematode Worms
  - 2. Mite
  - 3. Rotifer
  - 4. Tardigrade
  - 5. Springtail

## **15. What is the Climate in Antarctica?**

- Antarctica is the coldest and windiest continent.
- The lowest temperature recorded in Antarctica was -89.2°C (-128.6°F) in 1983.
- Very strong winds blow on the continent continuously for large periods of time.
- The fastest wind speed ever recorded was 327 km/h (199 mph) in Antarctica in 1983.
- Antarctica is divided into three climatic regions:
  - 1. Interior of Continent – Very cold with less precipitation rates
  - 2. Coastal Areas – Mild temperatures and higher precipitation rates
  - 3. The Antarctic Peninsula Region – Warm and Wet climate with comparatively higher temperatures in summer.
- Blizzards are very common in Antarctica. The strong winds move the already fallen snow from one place to another.

- There are only two polar seasons in Antarctica – summer and winter.
- In summer, the sun doesn't set for 6 months. The average temperature ranges from  $-26^{\circ}\text{C}$  to  $-3^{\circ}\text{C}$ .
- In winter, the sun doesn't rise for 6 months. The average winter temperature is  $-49^{\circ}\text{C}$ .



## 16. Why is Antarctica cold?

Following factors contribute to the cold weather of Antarctica:

### 1. Sunlight

- The maximum amount of sunlight and heat is available at the equator because sunlight strikes straight (right angle).
- As we move away from the equator towards the poles, the amount of available sunlight and heat decreases because the angle of incidence of sunlight decreases from 90 degrees.
- So, less amount of sunlight and heat is spread over larger area as compared to the equator.

### 2. Altitude

- For every 100 meters rise in altitude, the temperature falls by  $1^{\circ}\text{C}$ .
- Antarctica is the highest continent with an average elevation of 2,300 meters above the sea level.

### 3. Landmass

- Antarctica is a very huge landmass.
- The only areas affected by the sea temperatures are the coasts.
- Apart from the coasts, Antarctica is not affected by the sea temperatures. So, it stays cold for very long periods of time.

## **17. Does it rain in Antarctica?**

- Yes. but rainfall or snowfall is very rare in Antarctica because it is a desert.
- It rains only at coastal areas, when the temperatures are above freezing level.
- When it snows, the snow build up over a large period of time to form thick sheets of ice.



## **18. Antarctic Treaty Facts**

- During the early 20th century, Argentina, Australia, Chile, France, Great Britain, New Zealand and Norway declared territorial claims to parts of Antarctica.
- In 1959, these nations signed a treaty called the Antarctic Treaty.
- According to this treaty, these nations put aside their territorial claims in interests of mutual cooperation in scientific research.
- In 1994, another protocol was approved to the treaty which banned oil and mineral exploration on Antarctica for 50 years.

## Protecting Antarctica



The Antarctic Treaty has been signed by 45 countries, including Britain. They meet each year to discuss the future of the continent.



- A unique set of international regulations - the Antarctic Treaty System - protects Antarctica.
- The Antarctic Treaty (1961) suspends territorial claims and preserves the continent for science and peace.
- The Treaty has been reinforced by other agreements. The most important are:
  - the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) (1982)
  - the Madrid Protocol on Environmental Protection (1998)

## 19. Amazing Facts about Antarctica

- Antarctica is considered a desert despite the fact that it holds 70% of the fresh water on Earth.
- Some areas of Antarctica are so identical to the areas on Mars that they have been used by NASA for testing space equipment.
- Fire is one of the most dangerous things on Antarctica. It is very hard to stop a fire in Antarctica due to lack of water.

- Antarctica wasn't always cold. Fossil discoveries have shown that about 50 million years ago, Antarctica had green forests with lots of animals and birds.

