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UNIT 1: THE EARTH

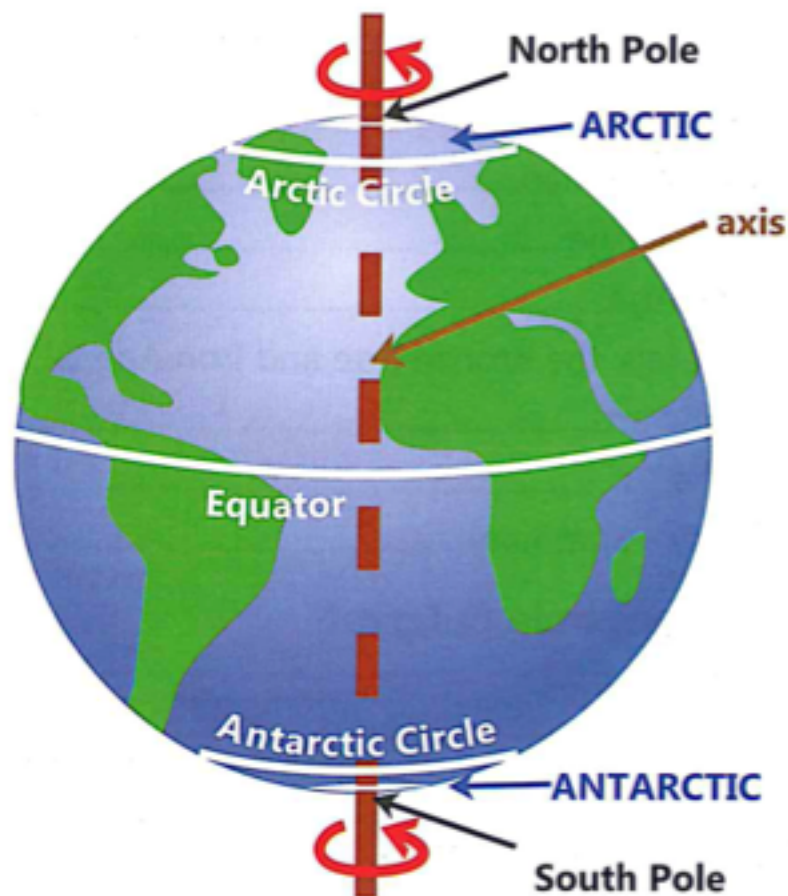
@rosaliarte



1. In this Unit...

The first chapter is about the Earth, and how we show it on maps

1.1 The Earth



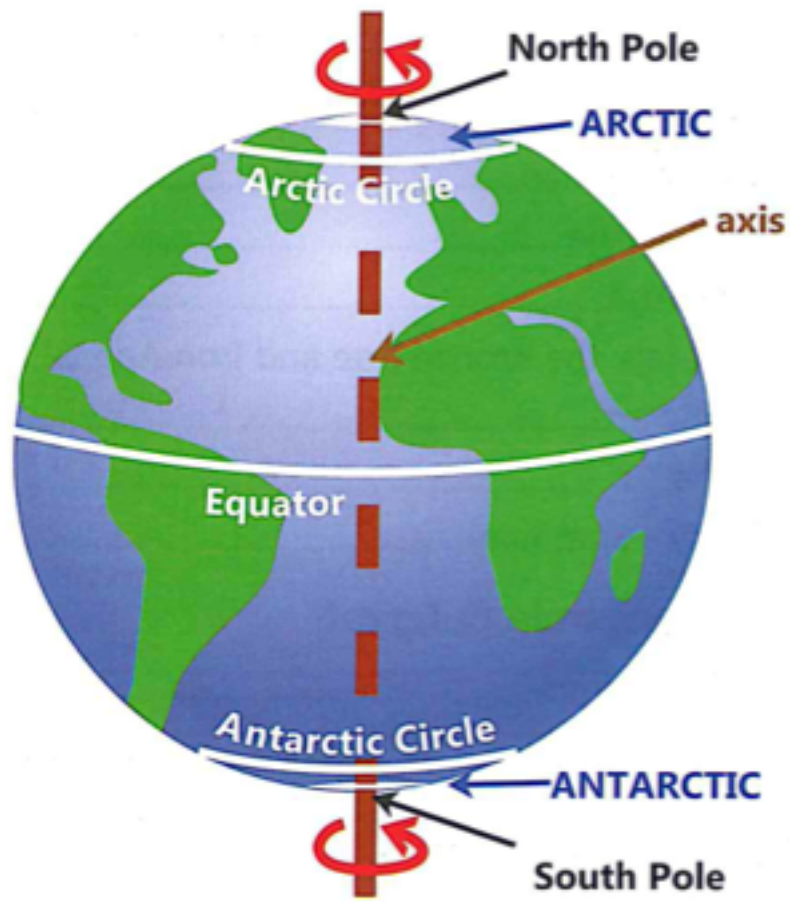
The Earth is a sphere. It rotates on its axis. The axis is an imaginary line through the centre of the Earth.

*The **Earth** is not a *perfect* sphere because it is slightly **flattened** at the **poles**.

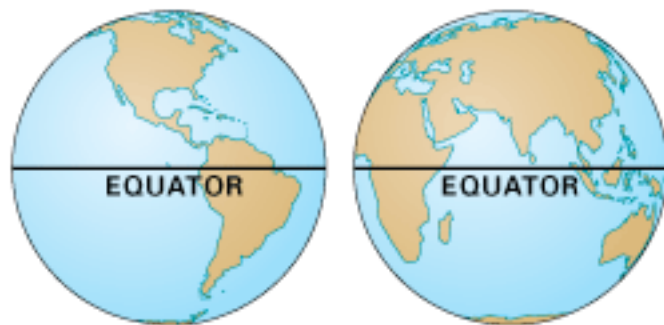
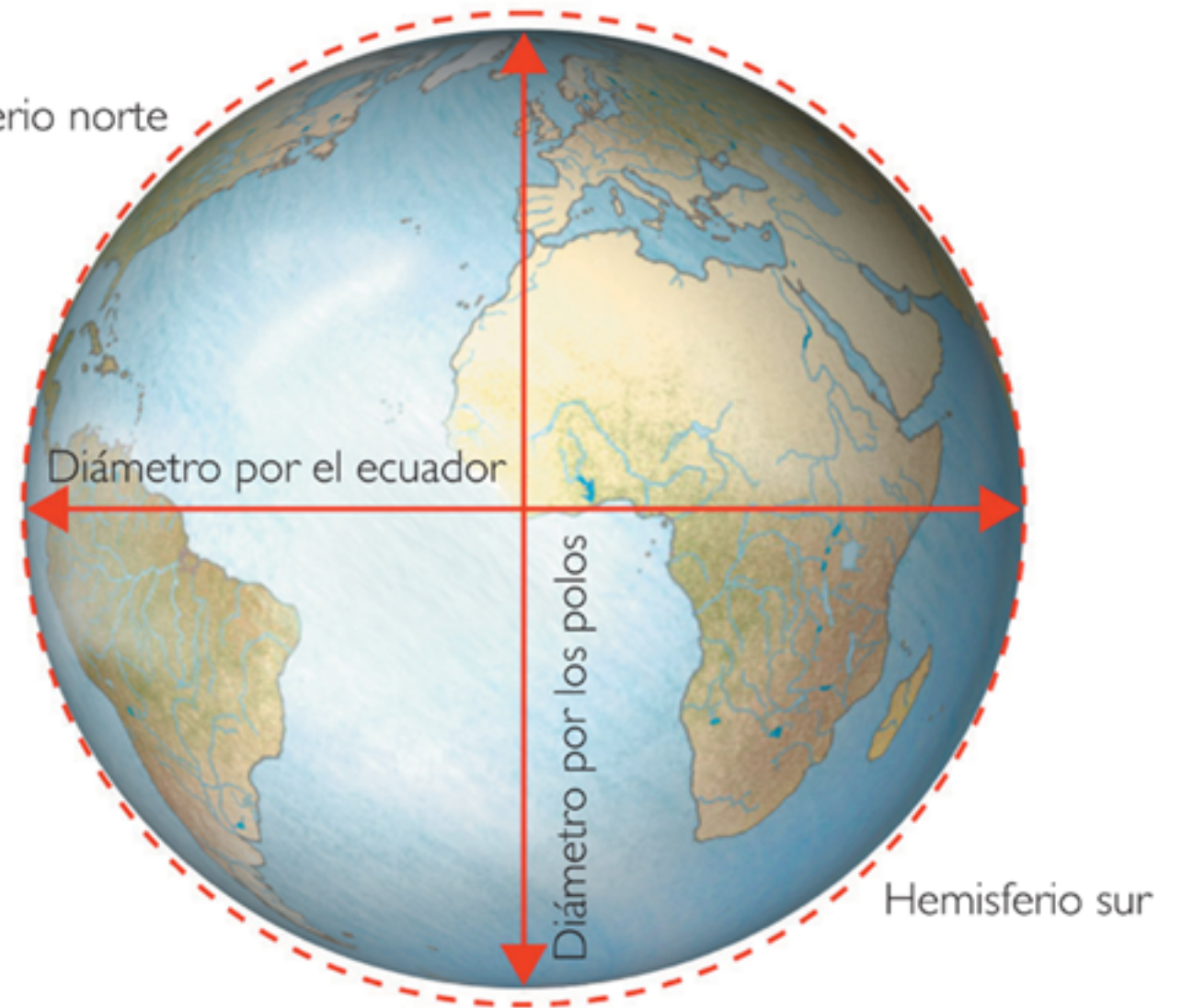


- **POLES:** The places where the axis meets the surface of the Earth are called the North Pole, and the South Pole.
- **ARCTIC:** the area around the North Pole. The Arctic Circle marks the edge of the Arctic.
- **ANTARCTIC:** The area around the South Pole. The antarctic Circle marks the edge of the Antactic.
- **EQUATOR:** An imaginary line around the Earth. It is the same distance from the North Pole and the South Pole.
- **HEMISPHERES:** The Earth has two hemispheres:





Hemisferio norte



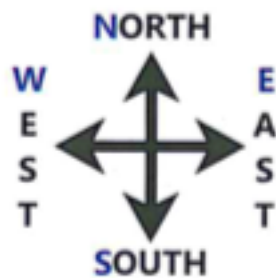
Imágenes
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Diámetro por el ecuador	12.756 km
Diámetro por los polos	12.713 km
Volumen	1,083 billones de km ³
Masa	5.854 trillones de toneladas



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1.2 The compass



Navigation is finding the way from one place to another. To help us, we can use a compass. A compass shows us the directions north, east, south and west. These are the four main compass points.

They are often abbreviated to N (north), E (east), S (south), W (west).

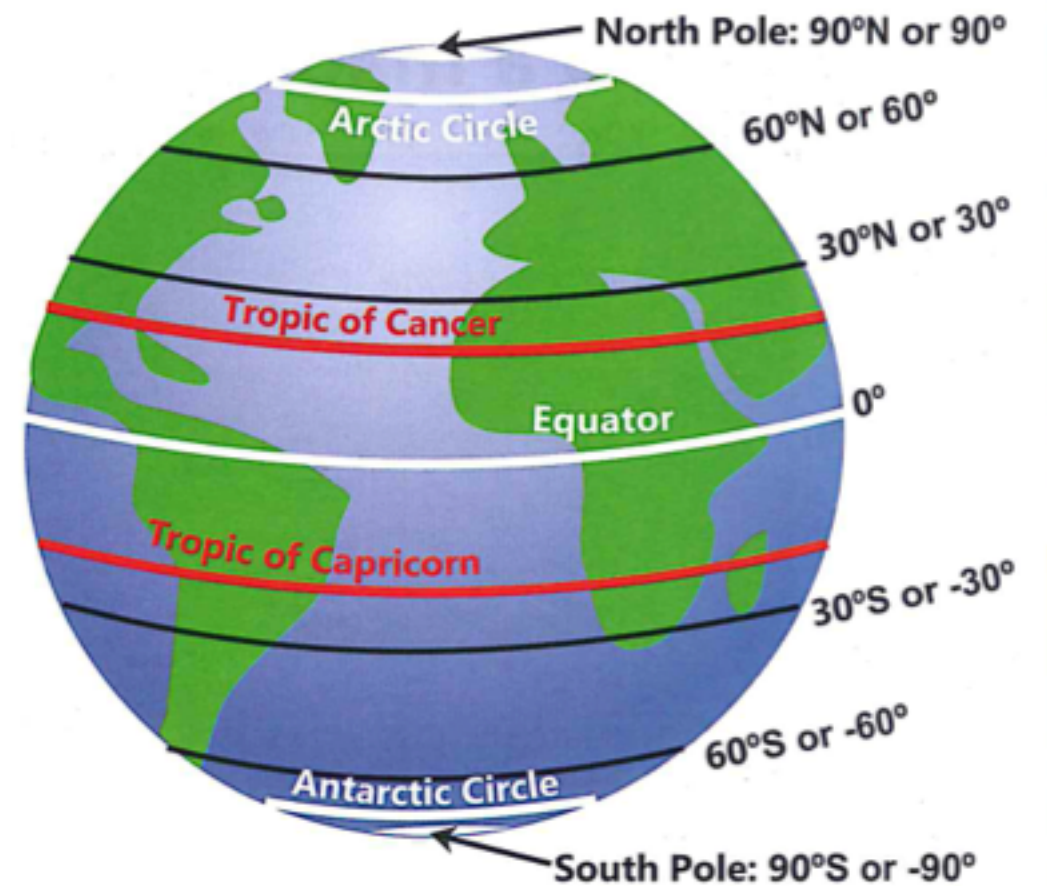
The points between N, S, E and W are called north-east (NE), south-east (SE), south-west (SW), north-west (NW)

2. LATITUDE

- Latitude is how far north or south of the equator a place is. Lines that connect places with the same latitude are called lines of latitude. Lines of latitude are parallel to the equator. Sometimes they are also called parallels.
 - We measure latitude in degrees
 - The equator has a latitude of 0 degrees (0°)
- **Northern Hemisphere:** Places to the north of the equator have a latitude of between 0° and 90 degrees north (90°N). The North Pole has a latitude of 90°N
- **Southern Hemisphere:** Places that are south of the equator have a latitude of between 0° and 90 degrees south (90°S)



Instead of N and S, we sometimes use:
Positive latitudes for the Northern Hemisphere
Negative latitudes for the Southern Hemisphere



The most important lines of latitude are:

- The equator
- The Tropic of Cancer and Tropic of Capricorn
- The Arctic Circle and the Antarctic Circle



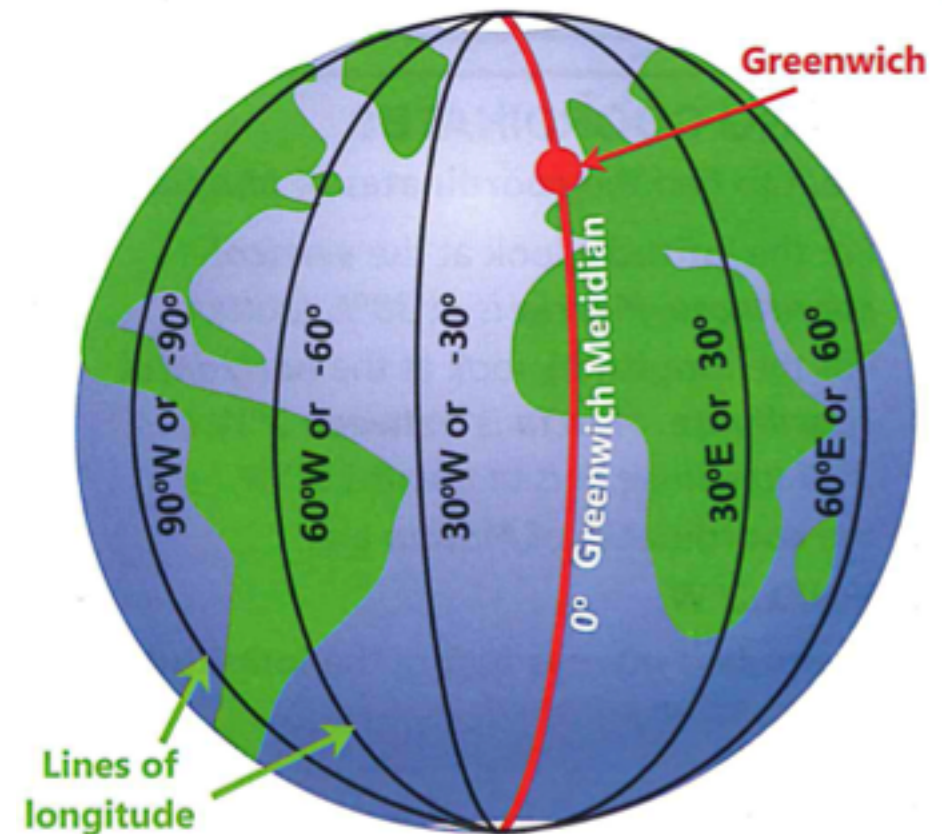
3. LONGITUDE

- **Longitude** is how far east or west a place is. Lines that connect places with the same longitude are called **lines of longitude or meridians**. They go between the North Pole and the South Pole
 - We measure longitude in **degrees**
 - The Greenwich Meridian or Prime Meridian has a longitude of 0 degrees (0°). The Greenwich Meridian goes through Greenwich in London
 - Places that are east of Greenwich have a longitude of between 0° and 180 degrees east (180°E)
 - Places to the west of Greenwich have a longitude of between 0° and 180 degrees west (180°W)



Instead of E and W, we sometimes we use:
Positive longitudes for places to the east of
Greenwich
Negative longitudes for places to the west
of Greenwich

You are most likely to find positive and
negative longitudes used on Internet maps



6. HOW TO READ A

Longitude

Latitude

Grid Lines:

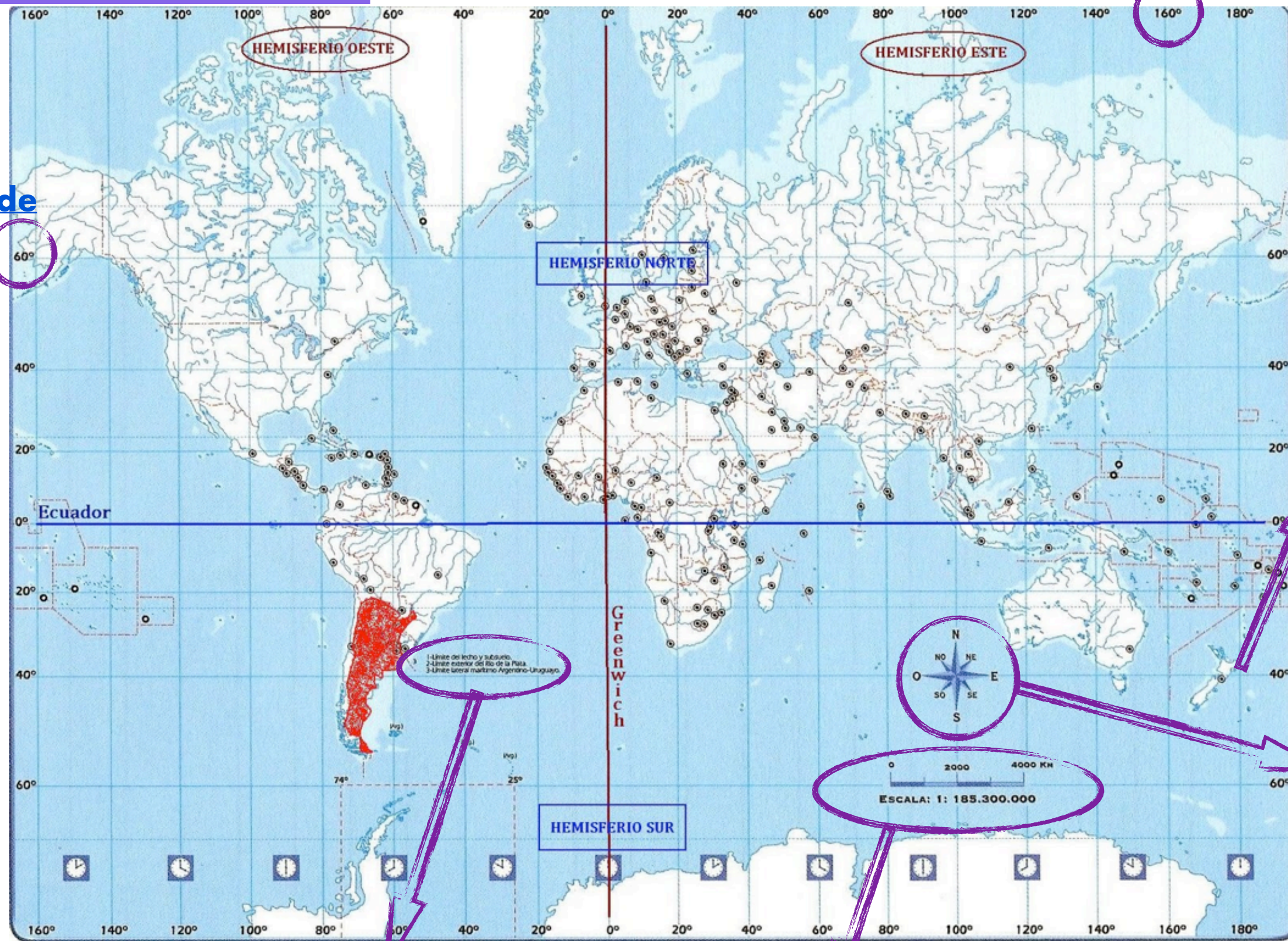
The grid lines are the lines of latitude and lines of longitude. They show exactly where places on the map are

Direction:

Maps normally show which way is north.

Key or legend: Tells us what the symbols on the map mean

Scale: The scale bar shows how the distances on the map relate to real distances



Reading coordinates

We want to find the **coordinates** of *Murcia*.

1. For the **latitude**, look at the **vertical coordinate**. *Murcia* is at 38°N latitude.
2. For the **longitude**, look at the **horizontal coordinate**. *Murcia* is **between** 1°W and 2°W longitude. It is at about 1.2°W .

So, the **coordinates** of *Murcia* are:

38.0°N , 1.2°W .

The **latitude** is *always before* the **longitude**.

Using the scales

The **map** on this page has a **scale bar**, but we can also write the **scale** in **different ways**, for example:

- $1\text{cm} = 100\text{km}$ (this means that 1cm on the map is 100km)
- $1:10,000,000$ (this is the same as $1\text{cm} = 100\text{km}$ because there are 10 million cm in 100km)

To work out the real distance:

1. **Measure** the **distance** with a **ruler**. The distance **between Cádiz and Málaga** is 1.8cm.
2. For a scale of **1cm = 100km**, we calculate:

$$\begin{aligned}\text{Real distance (in km)} &= \text{Map distance (in cm)} \times 100 \\ &= 1.8 \times 100 \\ &= 180 \text{ km}\end{aligned}$$



4. GLOBES AND MAPS

A globe is the most accurate way to represent the Earth. It is a small version of the Earth. A map shows the Earth on a flat surface. Maps are more useful than globes because:

- They are cheaper to make
- They are easier to store
- It is easy to make a map for a small or large area

There is also a disadvantage. When we make a flat map of the curved Earth, shapes and distances get distorted.

If we are looking at a large area (for example, the whole Earth), the map is very distorted. For a smaller area (for example, your home town) the map is much less distorted



TYPES OF MAP

- **Physical maps:** show the shape of the land, and water features like seas and oceans. More detailed physical maps are called topographic maps. They also show heights, roads, rivers, and place names.
- **Political maps:** show the boundaries between countries or regions. They also show towns and cities.
- **Thematic maps:** show a specific thing, for example: population, climate, types of industry or types of agriculture. This map shows the location of National Parks.



5. GPS

GPS is now very popular. It stands for Global Positioning System, and it uses satellites for navigation. This is why most people call it “Sat Nav”.



Glossary

<http://www.students.linguaframe.com/gh1-audio-glossary>

Earth, sphere, axis, rotate, North Pole, South Pole, Arctic, Antarctic, Arctic Circle, Antarctic Circle, Equator, Points of the compass, navigation, compass, direction, north, south, east, west, hemisphere, Northern Hemisphere, Southern Hemisphere, latitude, longitude, degrees, lines of latitude / parallels, lines of longitude / meridians, Greenwich Meridian / Prime Meridian, globe, map, scale, grid lines, coordinates, key / legend, Global Positioning System / GPS

