Geography and History

Key concepts

1 SECONDARY

Geography and History 1 Key concepts is a collective work, conceived, designed and created by the Secondary Education department at Santillana, under the supervision of **Teresa Grence**.

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Do not write in this book.
Do all the activities in your notebook.

Richmond SANTILLANA

Contents

1. Planet Earth 4

1. The Earth and its movements
2. The representation of the Earth

2. The Earth's relief 10

1. The Earth's crust and the Earth's relief
2. World relief
3. Relief formation
4. How does relief change?



3. Water 20

1. Continental water: rivers
2. Other continental waters: marine waters

4. Climate 26

1. Elements of climate
2. The Earth's climates
3. The climate and our lives

5. Natural landscapes 34

1. Hot climates
2. Temperate zones
3. Cold zones

6. The continents 42

1. Africa and Asia
2. America and Europe
3. Oceania and Antarctica

7. The physical relief of Spain 50

1. The relief of Spain
2. Rivers in Spain
3. Spain's natural environment



8. Prehistory 58

1. The Palaeolithic Age
2. The Neolithic Revolution
3. The Metal Age

9. Ancient Mesopotamia and Egypt 66

1. Mesopotamia: history and society
2. Mesopotamia: religion, architecture and art
3. Ancient Egypt: history and society
4. Religion and art in Ancient Egypt



10. Ancient Greece 76

1. Origins
2. The Classical and Hellenistic Ages
3. Life in Ancient Greece
4. Greek architecture and art



11. Ancient Rome 86

1. Origins, Monarchy and Republic
2. The Empire
3. Life in Ancient Rome
4. Religion, architecture and art

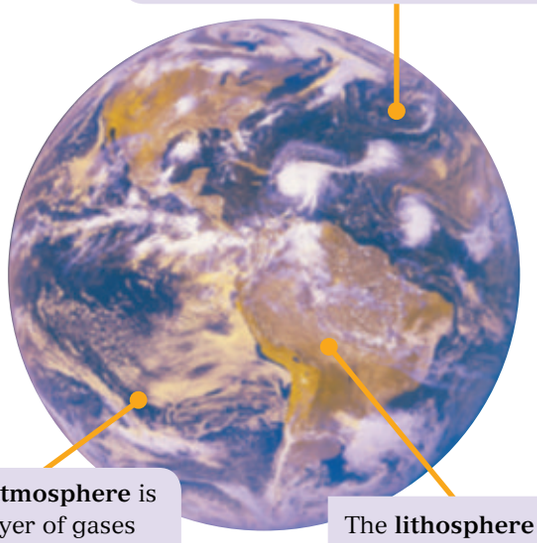
12. Spain in Antiquity 96

1. The Iberians and the Celts
2. The colonisers and Tartessos
3. Roman Hispania



1 Planet Earth

1 The Earth and its movements



2. THE OUTER STRUCTURE OF THE EARTH

The Solar System

The **Solar System** consists of a single star, the **Sun**, and the planets that **orbit** it. There are eight planets: **Mercury**, **Venus**, **Earth**, **Mars**, **Jupiter**, **Saturn**, **Uranus** and **Neptune**. (1)

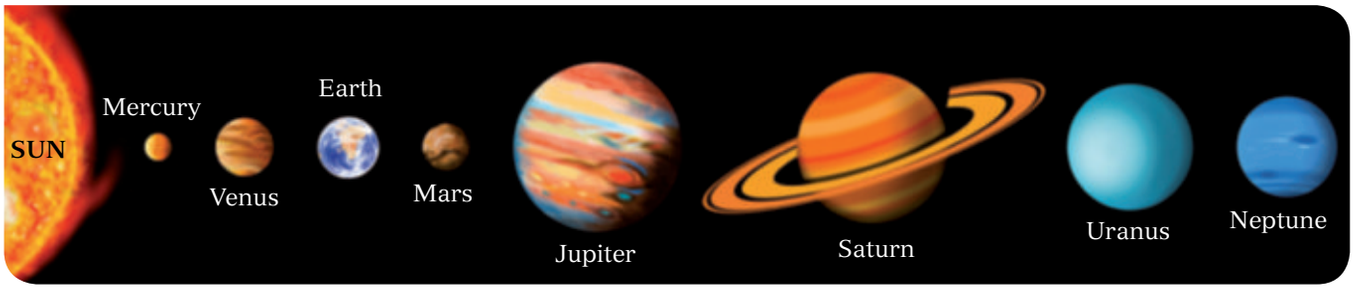
Our own planet, the **Earth** (2), is the fifth biggest planet in the Solar System. It has a surface area of 510 million square kilometres (km^2). It is the third closest planet to the Sun, which is 150 million km away.

Most planets in the Solar System have one or more **satellites**. The Earth only has one satellite: the **Moon**.

The Earth is the only planet in the Solar System where life exists. The following conditions make this possible:

- **Temperature**: its distance from the Sun means that it is not too hot or too cold.
- **Atmosphere**: it contains essential gases, like oxygen.
- **Water**: it is necessary for all living things.

1. THE SOLAR SYSTEM



GLOSSARY

Orbit: movement of one celestial body around another.

Satellite: celestial body that orbits a planet.

ACTIVITIES

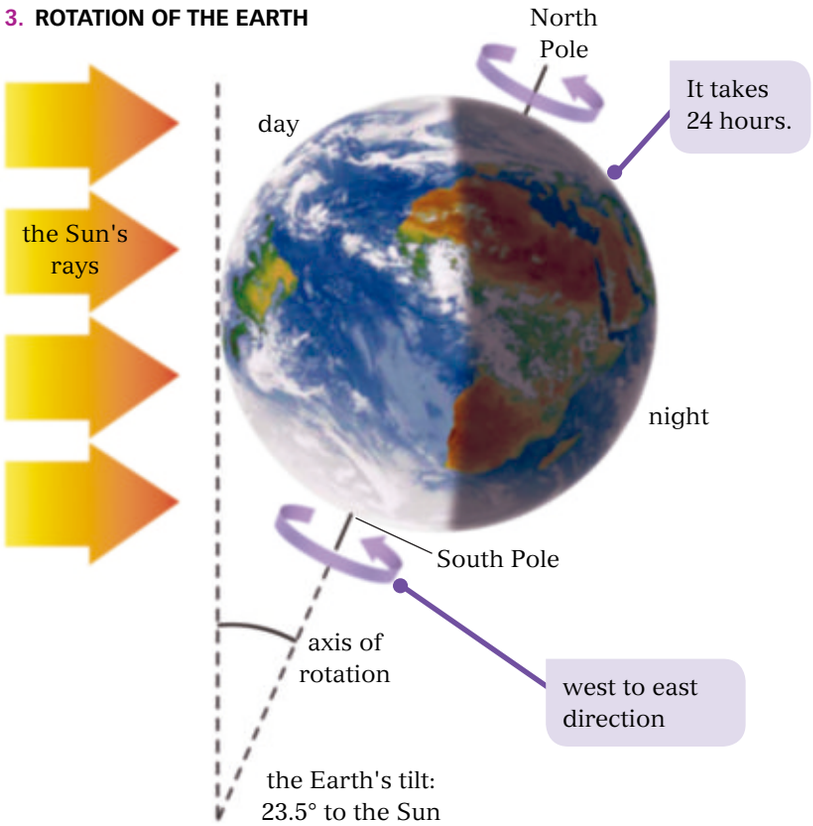
- What is the solid outer layer of the Earth called?
- What is the rotation of the Earth?
- What is the result of the revolution of the Earth?

The movement of the Earth

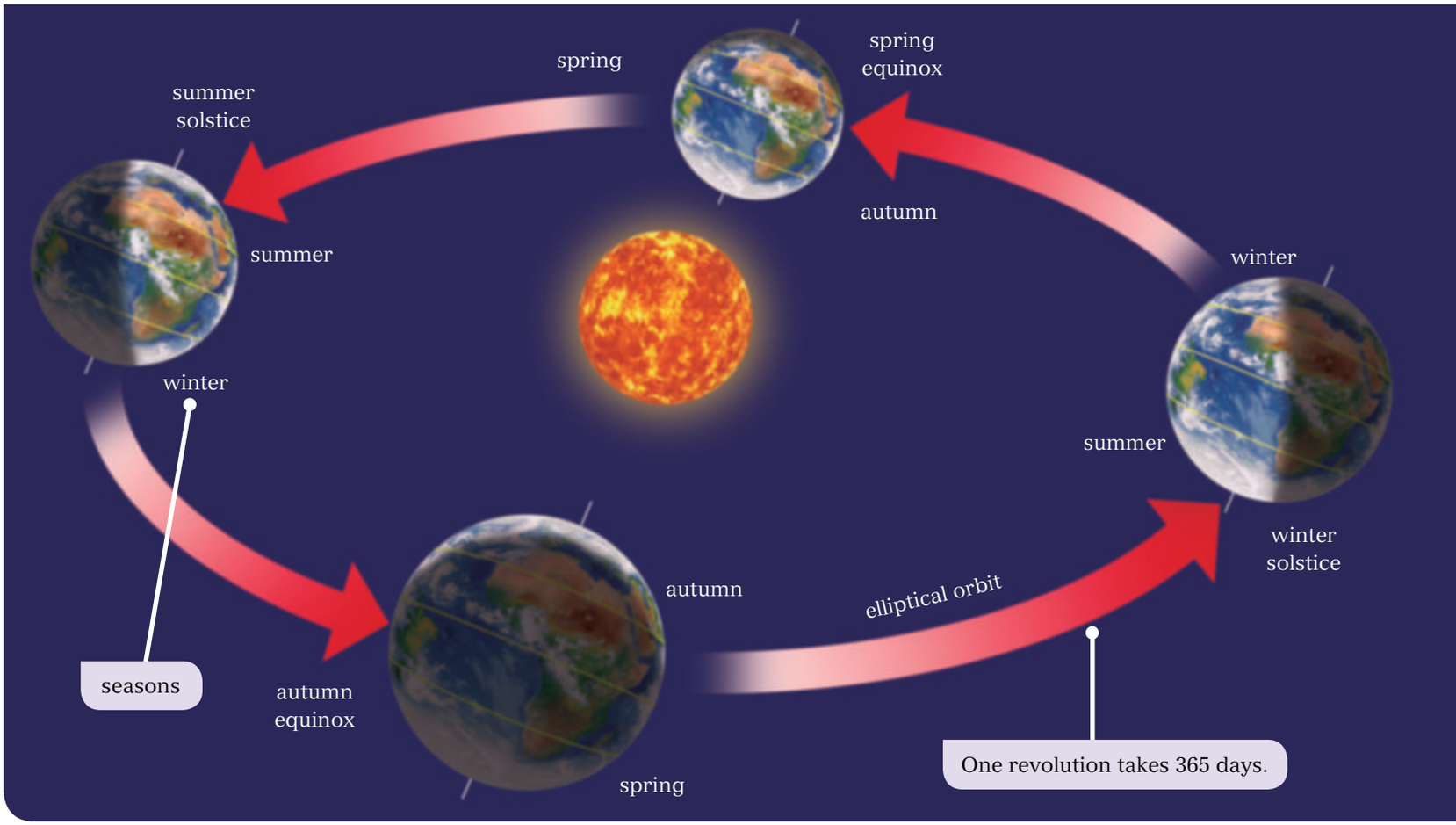
Like other objects in the Solar System, the Earth moves all the time. It has two types of movement: rotation and revolution. **(3** and **4)**

- **Rotation**: the Earth spins continually on its own **axis** and takes 24 hours to complete one rotation. This is what causes day and night, since one side of the Earth's surface receives the Sun's rays and the other does not.
- **Revolution**: it takes the Earth 365 days to move around the Sun. This movement causes the seasons of the year, as the angle of the Sun's rays changes in each hemisphere during the year.

3. ROTATION OF THE EARTH



4. REVOLUTION OF THE EARTH



2 The representation of the Earth

GLOSSARY

Scale: ratio between the real size of the territory and the size which is shown on the map.

The scale can be indicated in two different ways:

- Numeric scale: is expressed using a fraction. The numerator represents a unit of measurement on the map, for example 1 cm. The denominator represents its distance in the real world.

$$\frac{1}{200\,000}$$

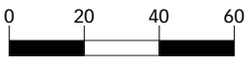
1 → Distance on the map

200 000 → Distance in the real world

SCALE

- Graphic scale: shows the equivalent distance on a bar divided into equal segments, usually 1 cm. The figures, which are usually expressed in kilometres, indicate the actual distance that each segment represents.

SCALE



Globes and maps

The Earth is not a perfect sphere. We call this shape a **geiod**. We can represent it with the following tools:

- **Globes** are accurate representations of the Earth because they have a similar shape to our planet.
- **Maps** are flat representations of the Earth's surface. Maps distort shapes, distances and surfaces. There are two main types:
  - **Topographic maps** show the main features of the natural environment, like mountains and rivers. They also include man-made features.
  - **Thematic maps** provide visual information on a particular subject in a specific area. They may show political, physical or human aspects.

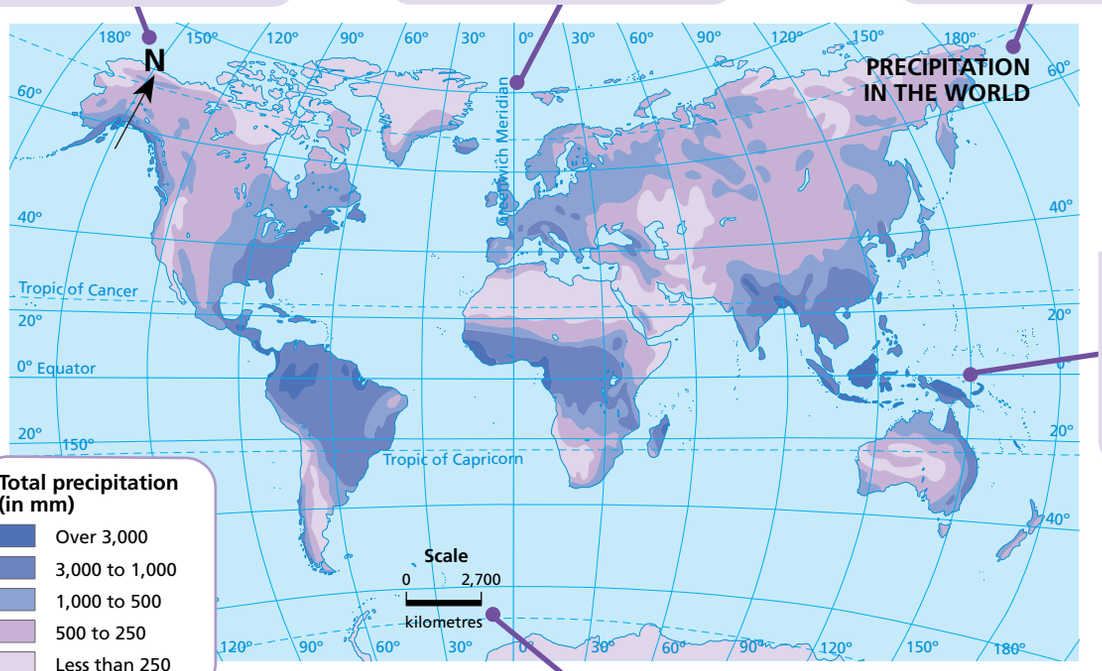
The main features of a map

A map has the following features: a title, a scale, a key, an arrow pointing north and a grid of imaginary lines and texts.

An arrow pointing north shows **orientation**.

Texts give us place names and other information.

The **title** tells us what the map shows.



The **key** shows the colours and symbols used on the map.

We use **parallels** and **meridians** to find the exact location of a place.

The **scale** indicates how far distances have been reduced.

Meridians and parallels

Meridians and parallels form a grid of imaginary lines that help us to find the exact location of any place on Earth. **(5)**

- **Meridians** are imaginary semicircles running in a north-south direction from the North Pole to the South Pole.
- **Parallels** are imaginary circles running in an east-west direction.

Longitude and latitude

Longitude and latitude indicate the geographic coordinates of a place, giving its exact location on the Earth's surface.

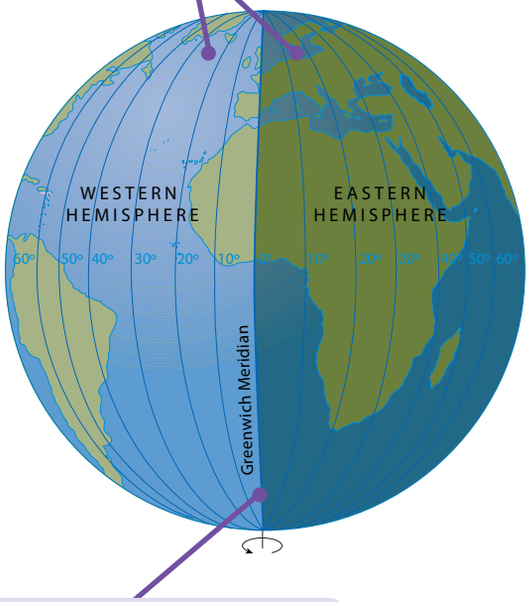
- **Longitude** is the distance from a meridian to the Greenwich Meridian.
  - Meridians show longitude.
  - Its values go from 0º at the Greenwich Meridian to 180º.
- **Latitude** is the distance from a parallel to the Equator.
  - Parallels show latitude.
  - Its values go from 0º at the Equator to 90º.

ACTIVITIES

- What tools can we use to represent the Earth?
- What are the differences between parallels and meridians? Which lines are used to measure longitude? And latitude?
- What is the maximum value of longitude? What is the maximum value of latitude?

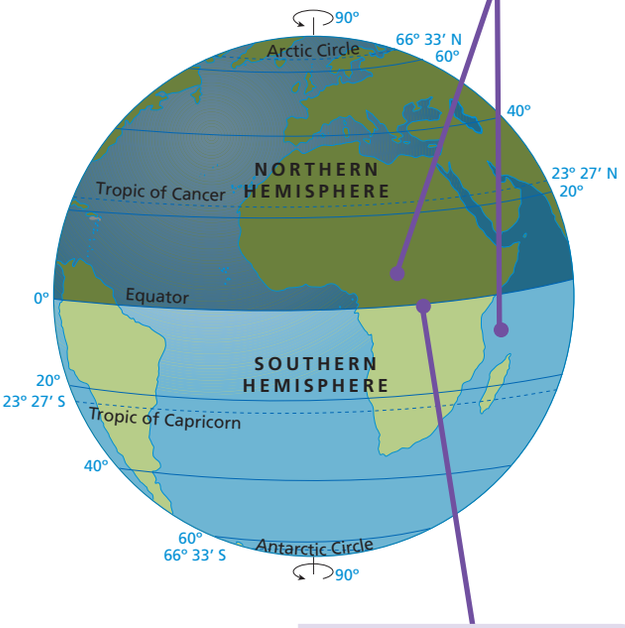
5. MERIDIANS AND PARALLELS

Longitude can be east (E) or west (W).



The **prime meridian** (0º) is also called the **Greenwich Meridian**.

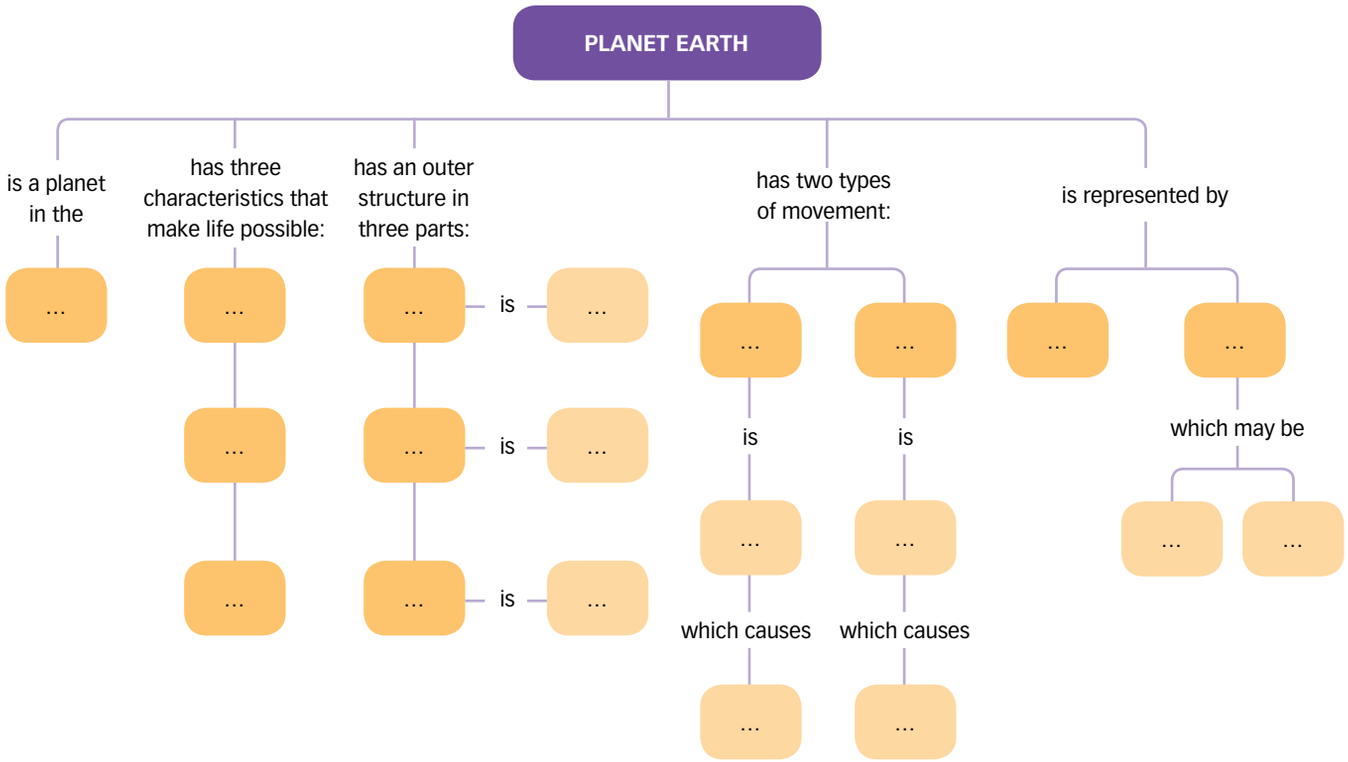
Latitude can be north (N) or south (S).



The most important parallel (0º) is the **Equator**.

ACTIVITY ROUND-UP

1 Copy and complete the diagram.



2 Explain the meaning of these terms:

- Scale
- Key
- Solar system

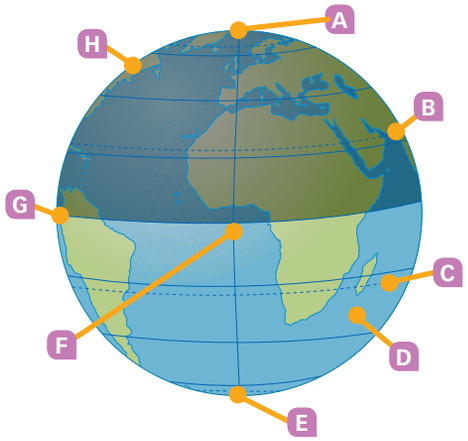
3 Explain the difference between the following terms:

- The hydrosphere and the lithosphere
- Parallel and meridian
- Latitude and longitude

4 Look at the photo and describe the outer structure of the Earth.



5 Copy the illustration below in your notebook. Label the following: the Equator, Tropic of Cancer, Tropic of Capricorn, North Pole, South Pole, Greenwich meridian, northern hemisphere, southern hemisphere.



6 Are the following sentences true or false? Correct the false ones in your notebook.

a The Earth is the only planet in the Solar System where life exists.

b Rotation is what makes the Earth orbit around the Sun.

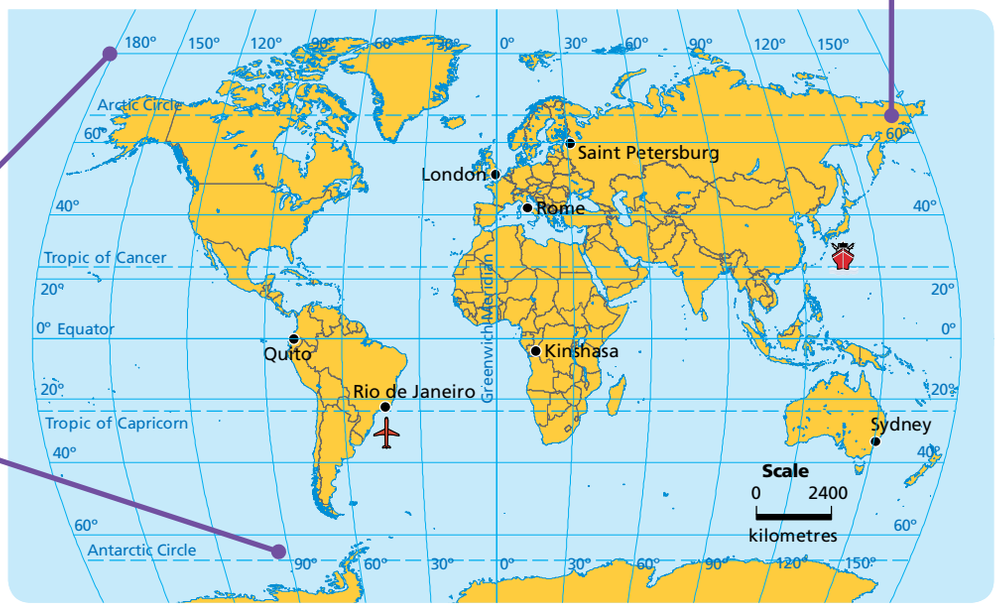
c The meridian of reference is the Equator, which divides the Earth into two hemispheres: east and west.

KNOW HOW TO. **How do we locate a place on a map?**

We can locate a place on a map if we have its **geographic coordinates**: its latitude and longitude.

To do this, we need to use the parallels and meridians that were created to locate places on Earth accurately.

Latitude is shown in numbers on the left and right of the map.



Longitude is shown in numbers at the top and bottom of the map.

To calculate the geographic coordinates of a particular place, first, we find the latitude (north and south), and then the longitude (east and west). Both coordinates are measured in degrees, minutes and seconds.

Follow these steps to locate a point on a map:

1. Identify the point that you want to locate on the map.
2. Then, you need to indicate its latitude. To do this, you must first note whether it is north or south of the Equator. Then, you must locate the closest parallel to that point.
3. Next, indicate the longitude. To do this, you must first note whether you are east or west of the Greenwich Meridian. Then, locate the nearest meridian to that point.
4. The point you want to locate may not be near a parallel or a meridian. If it is between two parallels or meridians, estimate which is closer.
5. Finally, indicate the coordinates of the point which you identified.

7 Copy the table below in your notebook. Complete it with the missing information.

City	Latitude	Longitude
Saint Petersburg	60º N	30º E
…	21º S	38º W
London	…	…
…	32º S	150º E
Rome	…	…
Quito	…	…
Kinshasa	…	…

8 Imagine that a ship is in difficulty. A rescue plane is searching for it. Look for the ship and the plane on the map above. Then copy and complete the sentences in your notebook.

The lost ship is in the … Hemisphere and its approximate coordinates are … It was going to 20º S, 120º E. Its direction should be…

The rescue plane is in the … Hemisphere, and its approximate coordinates are … Its direction will be … towards the ship.

2 The Earth's relief

1 The Earth's crust and the Earth's relief

The structure of the Earth

The Earth has three layers:

- The **crust** is the Earth's Surface. It is a thin, solid layer of rock.
- The **mantle** is the middle layer. It is made up of various materials, including liquid rock or **magma**. It has two parts: the upper mantle and the lower mantle.
- The **core** is the deepest layer. The outer core is liquid, but the inner core is solid.

1. MAIN TYPES OF RELIEF



Oceans and continents

The Earth's crust consists of **oceans**, which cover 70% of the planet's surface, and **continents**, which make up the remaining 30%.

Continents are very large land masses, surrounded by oceans and seas. The six continents are **Asia**, **America**, **Africa**, **Antarctica**, **Europe** and **Oceania**.

Oceans are vast masses of salt water. The five oceans are connected to each other: the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean and the Arctic Ocean.

What is the Earth's relief?

The surface of the Earth's crust has various parts which make up the **Earth's relief**. It is divided into: **(1)**

- **Continental relief**.
- **Coastal relief**. Coasts are formed in areas where land meets seas and oceans.
- **Relief on the ocean floor.**

ACTIVITIES

- Define: plain, valley, gulf, cape, ocean trench.
- Describe the internal structure of the Earth.
- Look at the drawing. Is the underwater relief flat? Give examples.

GLOSSARY

1. **Mountain:** high landform with steep sides.
2. **Valley:** area of low land between mountains.
3. **Plateau:** high, raised plain.
4. **Plain:** low, flat area of land.
5. **Beach:** area of sand or stones next to the sea.
6. **Cliff:** steep rock formation.
7. **Continental shelf:** underwater plateau that surrounds a continent, reaching a depth of up to 200 m.
8. **Gulf:** portion of the sea that is partly enclosed by land.
9. **Continental slope:** steep slope that leads down from the continental shelf into the deeper part of the ocean.
10. **Island:** area of land that is completely surrounded by water.
11. **Isthmus:** strip of land connecting a peninsula to a continent.
12. **Abyssal plain:** vast plateau that forms part of the ocean floor.
13. **Peninsula:** area of land that is almost entirely surrounded by water.
14. **Cape:** strip of land that extends into the sea.
15. **Ocean trench:** long, deep crack in the ocean floor.
16. **Mid-ocean ridge:** long mountain ridge that is found on an abyssal plain.



2 World relief

CONTINENT	RELIEF FEATURES
America	• Mountain ranges: Rocky Mountains, Sierra Madre, and the Andes. • Plateaus: Altiplano in Bolivia and Mato Grosso in Brazil. • Plains: Plains of the Mississippi and Amazon rivers. • Islands: Greenland. • Coast: peninsulas (Labrador, Florida, Yucatán, Alaska and California).
Europe	• Mountain ranges: Caucasus, Carpathians, Alps and Pyrenees. • Great European plain. • Islands: Sicily, Crete, Sardinia, Balearic Islands, etc. • Coast: peninsulas (Scandinavian, Balkan, Italian, Iberian, etc.).
Africa	• Mountain ranges: Atlas and Drakensberg mountains. • Several plateaus. • Islands: Madagascar. • Coast: Somali peninsula and the Gulf of Guinea.
Asia	• The Himalayan mountain range is the highest in the world. • Tibet is the highest plateau in the world and the Dead Sea is the deepest depression. • Islands: numerous archipelagos (Japan, Philippines, etc) and islands (Sumatra, Borneo, etc.) • Coast: large peninsulas (Arabic, Hindustan, Indochina, etc.) and gulfs (Persian, Bay of Bengal, etc.).
Oceania	• Mountain ranges: The Great Dividing Range. • Several islands. Australia is the largest in the world.
Antarctica	• It is mainly covered by ice.

ACTIVITIES

- Look at the map:
  - What is each continent's highest mountain range? What is each continent's highest peak?
  - Name an island on each continent.




ARCTIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
SOUTHERN OCEAN
Greenland Sea
Iceland
Denmark Strait
Norwegian Sea
North Cape
Barents Sea
Kara Sea
TAYMIR PENINSULA
East Siberia Sea
Scandinavian Mountains
SCANDINAVIAN PENINSULA
British Isles
North Sea
Baltic Sea
GREAT EUROPEAN PLAIN
EAST EUROPEAN PLAIN
WEST SIBERIAN PLAIN
CENTRAL SIBERIAN PLATEAU
Verkhoyansk
Pobeda 3147 m
Kolyma
Bering Sea
Kolyma Upland
Stanovoy Range
Sea of Okhotsk
KAMCHATKA PENINSULA
Cape Lopatka
Volga
Ural
URAL MOUNTAINS
Yenisey
Ob
Irtysh
Lake Baikal
Lake Balkhash
Aral Sea
Caspian Sea
Black Sea
Beluja 4506 m
Sayan 3492 m
Yablonovy Range
Amur
MANCHURIA
Altai Mountains
GOBI DESERT
Tien Shan Mountains
Ismoil Somoni Peak 7495 m
Kunlun Mountains
K2 8616 m
Yellow river
KOREAN PENINSULA
Japan
Mount Fuji 3776 m
NORTH CHINA PLAIN
PLATEAU OF TIBET
HIMALAYAS
Mount Everest 8850 m
Indus
Ganges
THAR DESERT
IRANIAN PLATEAU
Hindu Kush
Zagros Mountains
Euphrates
Persian Gulf
ANATOLIAN PLATEAU
CAUCASUS MOUNTAINS
Mount Elbrus 5642 m
Mont Blanc 4807 m
ALPS
CARPATHIAN MOUNTAINS
Dniepr
Don
Danube
Rhine
Cape Finisterre
PYRENEES
ITALIAN PENINSULA
IBERIAN PENINSULA
Mount Etna 3349 m
Mulhacén 3478 m
Mediterranean Sea
Toubkal 4165
ATLAS MOUNTAINS
Ahaggar Mountains
Canary Islands
Teide 3715
LIBYAN DESERT
Tibesti Mountains
Mount Tahat 3003 m
SAHARA
Emi-koussi 3415 m
Cape Verde
Niger
Lake Chad
DARFUR PLATEAU
Nile
Red Sea
ARABIAN PENINSULA
Arabian Sea
Ras Dashen 4620 m
Ethiopian Plateau
SOMALI PENINSULA
Cape Guardafui
Mount Cameroon 4070 m
Lake Victoria
Mount Kenya 5199 m
Kilimanjaro 5895 m
Congo
Mitumba Mountains
Lake Tanganyika
Rift Valley
Lake Malawi
Zambezi
CENTRAL PLATEAU OF ANGOLA
KALAHARI DESERT
Mozambique Channel
Madagascar
Cathkin 3660 m
Drakensberg Mountains
Orange
Cape of Good Hope
HINDUSTAN PENINSULA
Cape Comorin
Bay of Bengal
INDOCHINA PENINSULA
South China Sea
Mekong
Formosa
Philippines
MICRONESIA
MELANESIA
Borneo
Sumatra
Java
New Guinea
Puncak Jaya 5030 m
KIMBERLEY PLATEAU
GREAT DIVIDING RANGE
Coral Sea
North West Cape
GREAT SANDY DESERT
GREAT VICTORIA DESERT
Cape Leeuwin
Great Australian Bight
Darling
Murray
Mount Kosciusko 2230 m
New Zealand
Tasmania
Mount Cook 3764 m
Weddell Sea
Scale
0 880
kilometres
30°
0°
30°
60°
90°
120°
150°
180°
80°
60°
40°
20°
0°
20°
60°
80°

3 Relief formation

Faults and folds

According to the **theory of plate tectonics**, the Earth's crust is formed of **tectonic plates**. Each one is a few kilometres thick. They fit together like pieces of a puzzle, and are constantly moving due to the Earth's internal forces.

Sometimes this movement causes the plates to collide with each other. When this happens, one plate slides under the other, towards the Earth's interior.

As a result of the movement of the Earth's mantle, the Earth's crust is under continuous pressure near the tectonic plate boundaries. This causes faults and folds. **(3** to **6)**

GLOSSARY

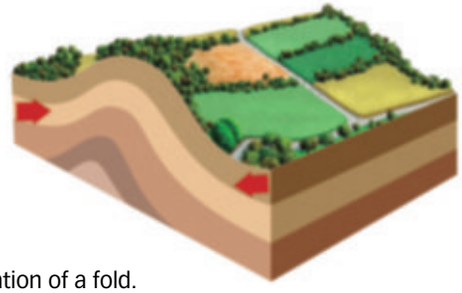
Magma: very hot material from the Earth's interior.

Tectonic plate: section of the Earth's crust which is constantly moving due to the internal forces of the Earth. A plate can be formed by land, the ocean floor, or by both.

Tsunami: series of giant waves caused by an earthquake or by a volcanic eruption on the ocean floor.

FOLDS

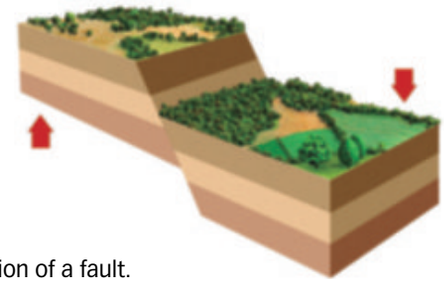
- When the internal forces of the Earth's crust act on softer rocks, the Earth's surface bends and forms **folds**. (3)



3. Formation of a fold.

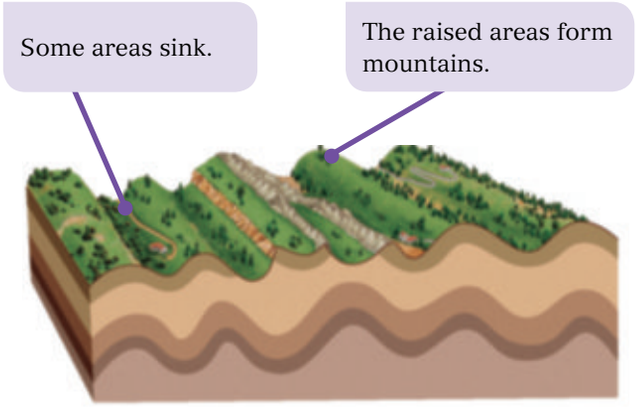
FAULTS

- When the internal forces of the Earth's crust act on rigid materials, the crust breaks and splits into blocks, called **faults**. (4)



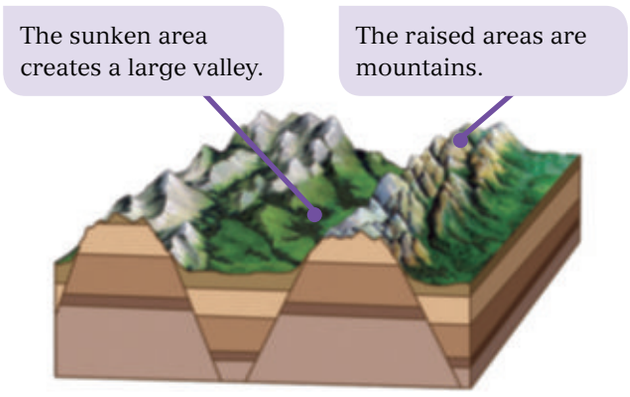
4. Formation of a fault.

- Some mountain ranges, or part of them, are formed by materials that fold. (5)



5. Landscape created by folds.

- Some blocks of land rise to form mountains and plateaus, while others sink to form valleys and plains. (6)



6. Landscape created by faults.

Volcanoes

Volcanoes are cracks in the Earth's crust that allow materials from inside the Earth to escape, at high temperatures. **(7)**

These cracks are formed by two tectonic plates clashing together, or as a result of the Earth's internal forces.

Most volcanoes are found near the boundaries of tectonic plates, where the Earth's crust is weakest.

Most volcanic eruptions occur on the ocean floor.

Earthquakes

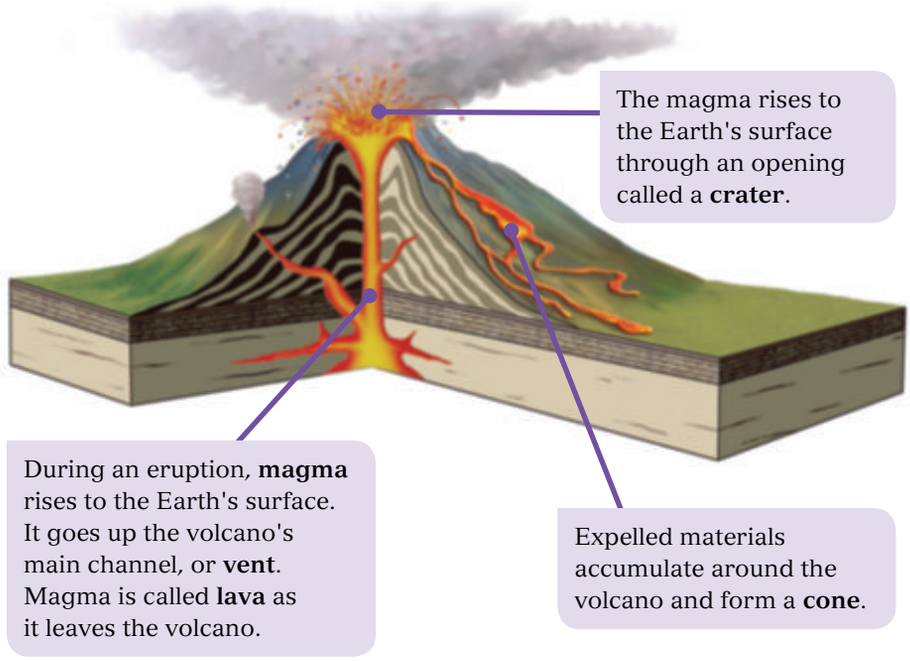
Earthquakes or tremors are violent movements of the Earth's crust. **(8)** The most intense earthquakes are capable of changing the Earth's relief.

They are caused by the collision of plates, the movements of faults or volcanic eruptions.

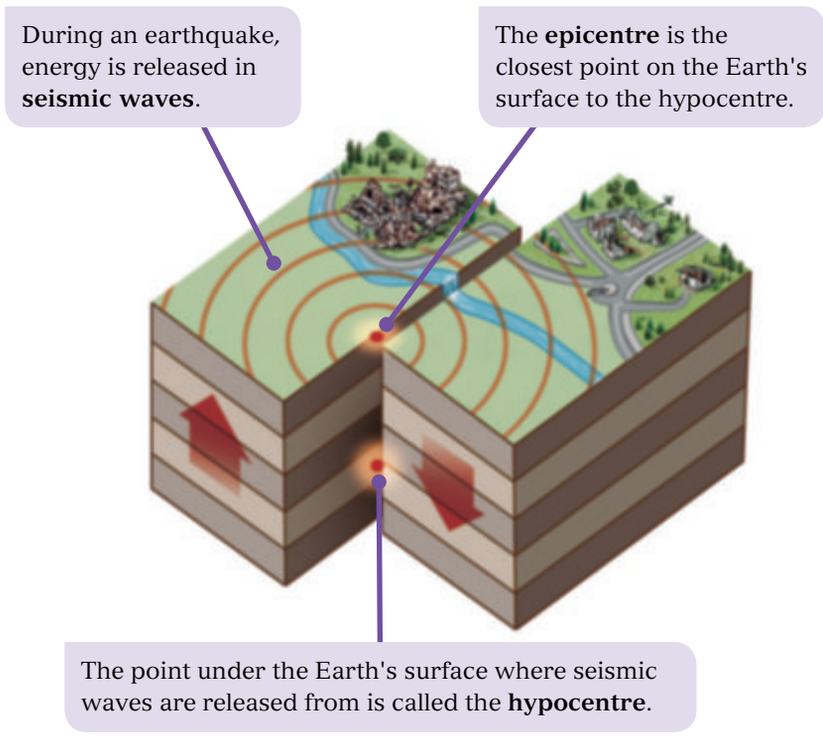
A **tsunami** or **tidal wave** is a series of giant waves, which are caused by an earthquake or a volcanic eruption on the ocean floor.

The magnitude of an earthquake is measured using a seismograph.

7. ERUPTION OF A VOLCANO



8. EARTHQUAKE



ACTIVITIES

- Define the following terms: fault, fold, volcano, lava.
- Explain how an earthquake occurs. You can draw a diagram to help.

4 How does relief change?

Changes in relief

Terrestrial relief changes over the course of time due to the actions of **external forces or agents**: temperature, water, wind and living things. There are three main processes: **erosion**, **transportation** and **deposition**.

AGENTS THAT MODIFY RELIEF

Temperature

- There is a great difference between daytime and night-time temperatures in mountains and deserts.
- Water enters the cracks in rocks and then freezes. As water expands when it freezes, the changes in temperature can break the rocks. **(9)**

Wind

- Wind transports materials that collide with rocks and wear them down.
- Particles of eroded materials are deposited, forming sand **dunes**. **(10)**

Water

- Water dissolves rocks, creating caves.
- Rivers modify relief along their whole path: in the upper slopes, they erode materials forming **canyons** and **valleys**; they transport eroded material along their middle course; and they deposit sediments in low areas. **(11)**
- Waves and currents form **cliffs** (erosion) and **beaches** (deposition).

Living things

- Rocks and soil are fragmented by tree roots and the tunnels that animals dig.
- Human beings make big changes to the Earth's landscape: the construction of buildings, tunnels, the expansion of farmland, etc. **(12)**



10. Desert (Libya).



12. Motorway (Galicia, Spain).



9. La Pedriza, Sierra de Guadarrama (Spain).



11. The Grand Canyon (USA).