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# GEOGRAPHY & HISTORY CONSOLIDATION

**1**  
SECONDARY



**Oxford**  
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# 1

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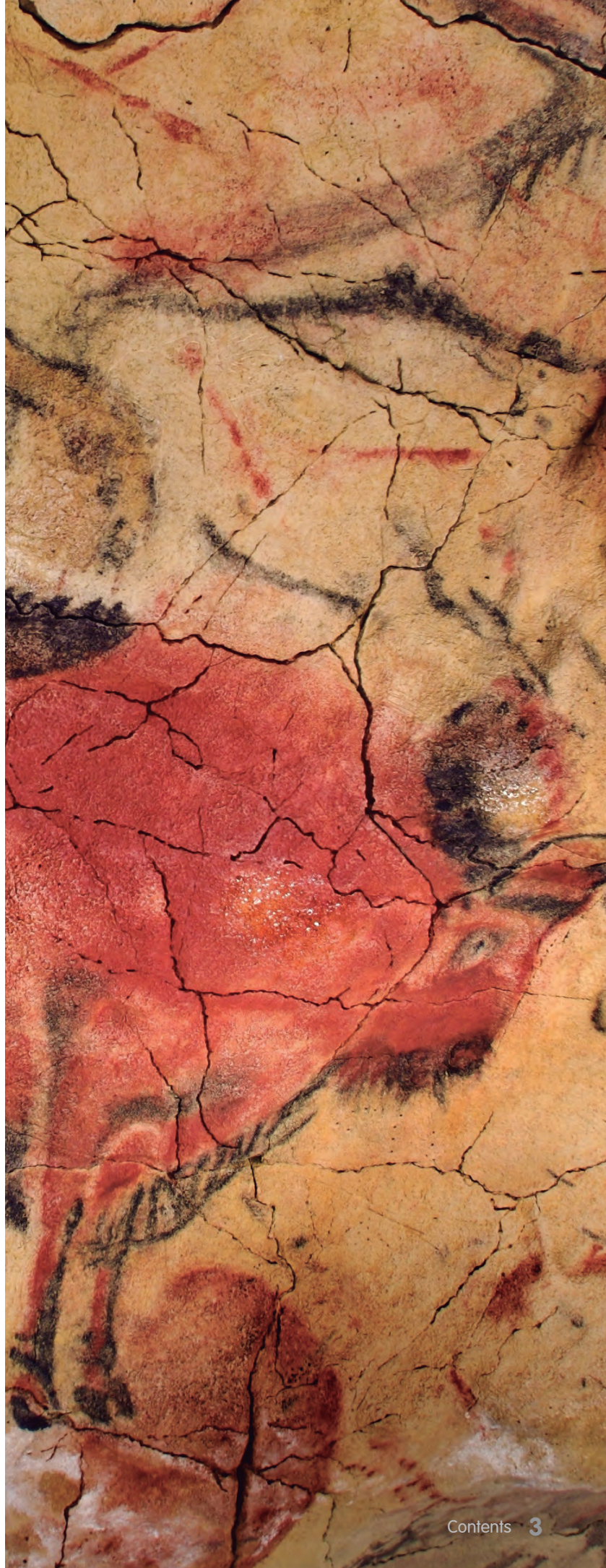
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# THE STUDY OF GEOGRAPHY

## BRANCHES OF GEOGRAPHY

Geography is divided into three major branches:

- **Physical geography:** the branch of geography that deals with the natural features of the planet (mountains, coasts, fauna...) and the elements that act on and affect it, such as climate and currents.
- **Human geography:** the branch of geography that deals with the study of the different people of the world, their communities and cultures, and their relations across space and place. This branch covers a range of areas including health, economics, politics and development.
- **Regional geography:** the branch of geography that involves identifying and defining the different regions (for example: countries, provinces...) of the world and studying their unique characteristics, such as their human and natural elements.

## GEOGRAPHIC INFORMATION TECHNOLOGIES (GIT)

Geographic Information Technologies (GIT) are the main tools used for representing and analysing our planet's geography. They include Digital Cartography (maps and plans), Remote Sensing and Geographic Information Systems (GIS).

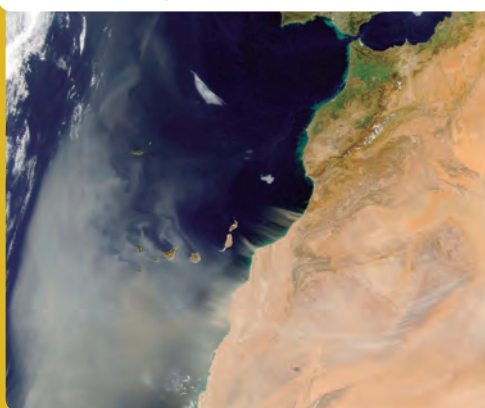
### Digital Cartography

A digital map or plan is a scale representation of a particular area showing physical or other features, for example a topographical map of Spain (in the image, a physical map of Spain).



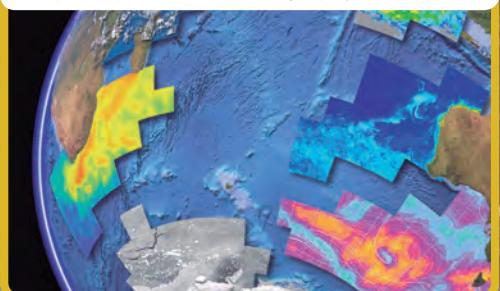
### Remote Sensing

Remote sensing is a way to obtain geographic information by scanning an area using digital equipment, for example satellites, cameras, buoys... (in the image, a Saharan sandstorm over the Canary Islands)



### Geographic Information Systems (GIS)

GIS are computer hardware and software systems that let you capture, store, check and display large amounts of data specific to positions on the Earth's surface, for example topography data, temperature data, rainfall data... (in the image, a representation of different parameters of the Indian ocean: temperature, rainfall, topography...)





# 1

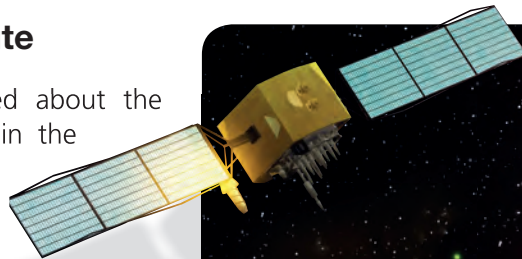
## PLANET EARTH AND ITS REPRESENTATION

Final task



### A well-mapped route

For centuries, our ancestors argued about the Earth's shape and about its place in the universe. They reached the correct conclusions with the help of the Sun and the stars and found **ways of locating** our planet. They also learned how to **represent** the Earth's surface, by making **maps**. Accurate map-making was a matter of life or death for travellers and sailors. Nowadays, with much more advanced technological resources, we are able to locate our exact position and find our way almost automatically.



When you travel to the countryside, are you able to plan a route there and back again without any problems? At the end of this unit you are going to put into practice some basic geographical orientation techniques that will make travelling safer.



### The Earth's movements

- **Rotation** is the movement the Earth makes as it turns on its own axis. One rotation takes **24 hours** and causes **day and night**.
- **Revolution** is the movement of the Earth around the Sun. It takes 365 days and 6 hours and causes the seasons.

### Geographic coordinates

- **Meridians** and **parallels** form an imaginary **geographic network** on the Earth's surface which lets us locate the position, or geographic coordinates, of any place in the world by combining **latitude** and **longitude**.
- **Parallels** are imaginary circles parallel to the Equator. **Meridians** are imaginary semi-circles going from pole to pole.
- **Latitude** is the angular distance between any point on Earth and the **Equator** (0° latitude). Latitude can be north or south and ranges from 0° (the Equator) to 90° (at the poles).
- **Longitude** is the angular distance between any point on Earth and the **prime** or **Greenwich meridian**. It can be east or west and ranges from 0° (Greenwich) to 180° (the **International Date Line** in the Pacific Ocean).

### The representation of the Earth

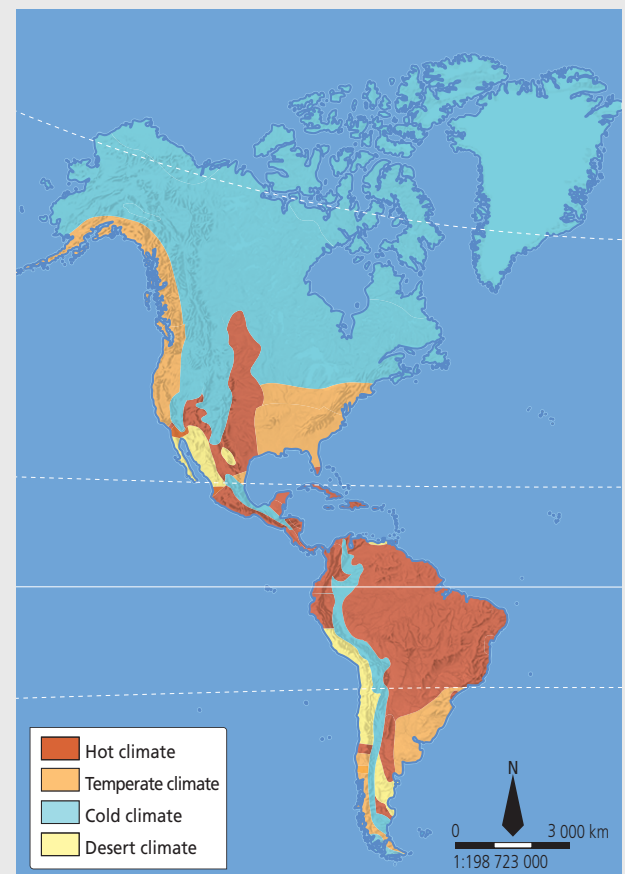
- **Maps** are true and proportionate representations of the Earth, or a part of the Earth, on a flat surface. The science of making maps is called **cartography**.
- **Map projections** are used to show the Earth's sphere on a flat surface. The most common are **cylindrical**, **conical** and **planar** projections.
- Maps can be **topographical** if they show relief or man-made features; or **thematic**, if they show specific features (physical, political, climate, etc.).
- **Street maps** show smaller areas, usually cities, towns, urban infrastructure or buildings. **Plans** show the interior organisation of buildings.
- The **scale** is the ratio between the size of the area represented on the map and its true size in reality. The scale can be **large**, **medium** or **small**, depending on the proportion (or ratio) we use.

### Time zones

- **Time zones** are **imaginary** vertical strips on the Earth's sphere of **15° longitude** each. There are 24 time zones and each strip is equal to one hour.
- Time zones allow us to estimate the difference between different areas and countries.

### Planet Earth

- Based on its **proximity to the Sun**, the Earth is the third planet in the **Solar System**. It is sphere-shaped, slightly flattened at its poles.
- The Solar System is located in a spiral galaxy called the **Milky Way**.
- The distance from the Sun, the abundance of water and the existence of an atmosphere make life on our planet possible.



Thematic map: climates of America



1. Use the Internet to find a picture of the Solar System and copy the following table in your notebook.

- Complete the table with the missing planets.
- What is the main cause of the differences in temperatures between the planets?

| PLANET  | DISTANCE FROM THE SUN (MILLIONS OF KM) | TEMPERATURE (°C) |
|---------|--|------------------|
|         | 58                                     | 167              |
| Venus   | 108                                    | 457              |
| Earth   | 150                                    | 14,8             |
|         | 228                                    | -87              |
| Jupiter | 778                                    | -121             |
|         | 1 426                                  | -139             |
| Uranus  | 2 871                                  | -197             |
| Neptune | 4 500                                  | -220             |

2. Look at the image of daylight spreading over Asia.

- a) Why are the continents on the left in shadow?
- b) Describe which regions of our planet can be seen.



3. Match each area with its corresponding cardinal point.

- Antarctic Circle
- Tropic of Capricorn
- southern
- eastern
- Tropic of Cancer
- western
- Arctic Circle

- SOUTH
- WEST
- NORTH
- EAST

4. Explain the differences between the following terms.

- a) Latitude and longitude.
- b) Rotation and revolution.
- c) A large scale map and a small scale map.

5. Copy the following in your notebook in alphabetical order and write definitions.

|           |          |                |
|-----------|----------|----------------|
| Equator   | rotation | revolution     |
| scale     | parallel | projection     |
| meridian  | latitude | prime meridian |
| longitude | tropics  | GMT            |

6. Write true (T) or false (F) and correct the false statements in your notebook.

- Latitude can be east or west.
- The Equator is at meridian 0°.
- The Tropic of Cancer is in the Northern Hemisphere.
- The scale is the ratio between the distance or surface shown on a map and the distance in reality.
- When it's summer in Spain it is winter in China.
- All of Spain is at longitude west.
- South America and Africa cover both hemispheres; north and south.
- In a cylindrical projection, the globe is projected onto a cone.

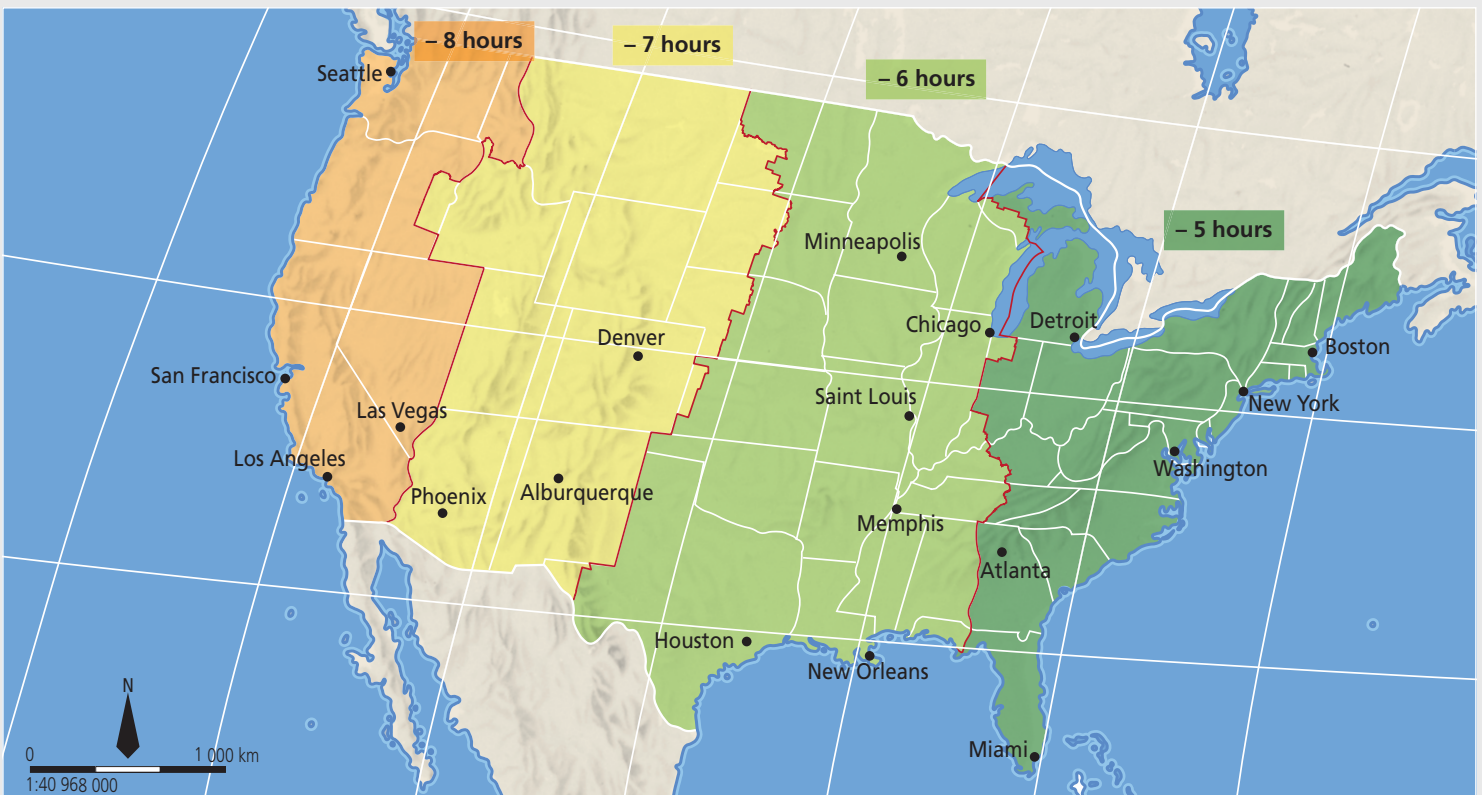
7. Can you name and define the lines on this map? Write them in your notebook.





8. If you arrive in Buenos Aires, the capital of Argentina (South America), on the 1 July, which season are you in?
9. Explain which type of scale is best to show the following places: America, Madagascar, Cantabria and La Vega of Granada?
10. Answer the following questions.
- Does a small scale map represent a large area? Does it show many details? Why?
  - What imaginary circle divides the Earth into two equal halves?
  - What is the relation between the distance of the Earth from the Sun and the existence of life on our planet?
  - At which point do the globe and the map of the Earth's features come into contact in a planar projection?
11. Look at the main islands in the Caribbean, such as Cuba and Puerto Rico, on a map of time zones and explain the following:
- How many time zones are between these islands and the Iberian Peninsula?
  - What time is it on these islands if it is 3 p.m. in Madrid?
12. Look at the map of the different time zones in the United States. If it's 12 p.m. in London (prime meridian), what time is it in New York? And in Los Angeles?

13. Copy and complete the sentences in your notebook.
- New York is located at 74° longitude \_\_\_\_\_.
  - The prime meridian passes through \_\_\_\_\_.
  - The Tropic of Capricorn is in the \_\_\_\_\_ Hemisphere.
  - The longest day of the year occurs in \_\_\_\_\_.
  - During the autumn equinox the Sun's rays fall \_\_\_\_\_ on the Equator.
14. Imagine that your town is the starting point of a trip around the world in a straight line.
- Work out the geographical coordinates of your town.
  - Follow the parallel of your town around the world and choose four places you find interesting.
  - Write the name, the complete geographical coordinates and some brief information for each place.
15. Write a presentation briefly summarising the contents of this unit.



# A well-mapped route

You are going to plan a trip (either real or virtual) to a natural setting in the area you live in. To do this, you will need a map of the area to mark your itinerary. Then, in order to follow the route, you will apply some basic geographic orientation techniques.

## MATERIALS

- Notebook
- Map of the area chosen
- Rope (1 or 2 metres long)
- Camera
- Compass
- GPS (optional)
- Mobile phone (optional)

## Preparation



In groups of four or five, choose where you want to go and find an adult to accompany you.

Then collect maps of the area (even if you can't take them with you).



You can find maps and explore places using Google maps (Google street view).

## Procedure



If you really go on the trip, try and find your way using some of the following methods.

If you do a virtual trip, explain the methods you could have used to find your way.

## ORIENTATION WITHOUT INSTRUMENTS

There are many ways you can find your way without using instruments. Here are some simple ways:

■ **Observe the position of the Sun.** At dawn, stand with your arms out in a cross. Point your right arm in the direction of the Sun, in the east. Your left hand is pointing west; north is in front of you and behind you is south.

If you turn your back to the Sun at 12 noon (solar time) your shadow will point north, your right hand, east; your left hand, west and your back will face south.

■ **Observe the shadow of a stick.** In a flat area, push a half metre-long or longer stick into the ground and observe its shadow.

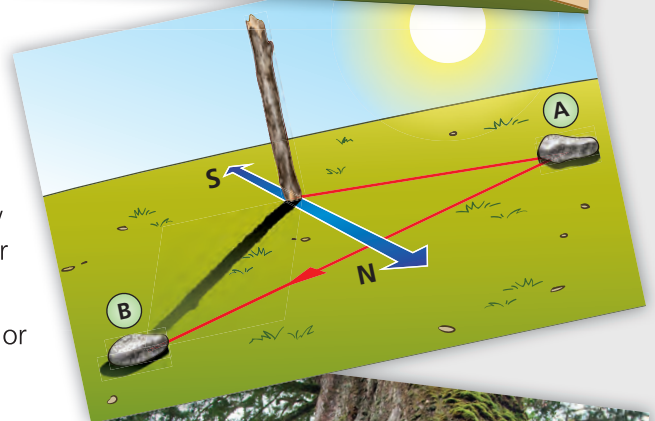
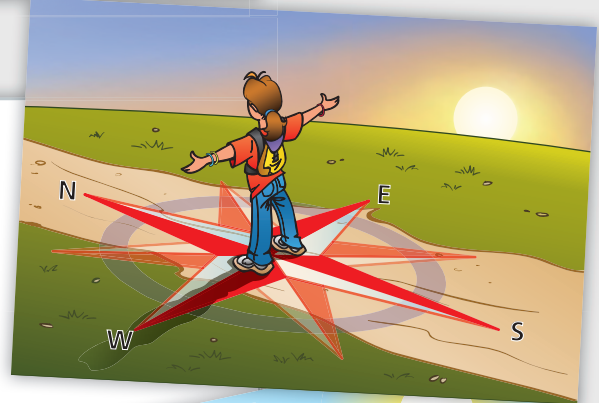
▶ Place a stone (A) on the shadow, 50 cm from the stick.

▶ Three hours later, the shadow will have moved. Place another stone (B) on the shadow, the same distance from the stick as the first stone. Mark a straight line between both points.

▶ Point A indicates west and B, east. If you mark a line from the stick to the centre of line (A-B) it will indicate north and behind the stick will be south.

■ **Observe the trees.** In wet forest areas, the trunks often have moss, lichen or are darker on one side. This side is usually the side facing north, which is cooler and wetter than the southern side.

■ **Observe the Moon.** When the Moon is close to its first quarter, or waxing crescent (1), the tips point west. In contrast, in the last quarter, or waning crescent (2), they point east.







## ORIENTATION WITH INSTRUMENTS

Nowadays there are many ways to find your way with different instruments. Some of these have been invented very recently:

- A **compass**, placed on a flat surface, will indicate north.
- A **map** is used to work out a route. Choose specific places to help you follow your itinerary and mark which direction you need to go in to get to them (for example, to get to the forest ranger's hut, go west). This will help you find the right path and correct your route if necessary.
- On a **GPS**, the coordinates of a place can be introduced and the directions followed. It is easy to use, but ask an adult to show you how.
- Many **mobile phones** now have location tracking services. These show you a map of the area, your location and what is close by.



## Communication and publication



Each group presents their experience to the rest of the class (the route chosen, methods of orientation used and difficulties). You can present your planned itinerary, images of the route you took, the methods of orientation you used and what you did so you did not get lost.

Even if you didn't actually go out on the route, show your itinerary and explain the methods of orientation you would have used.



## SELF-ASSESSMENT



1. What instruments would you put in your rucksack for an excursion? Explain what you would use each instrument for.
2. Which methods of orientation would you recommend to someone who wants to go on an excursion to the country? Explain why.
3. If you went somewhere you had never been before, what methods would be the best to avoid getting lost?
4. What information have you got from maps to do this task?
5. Which aspect of orientation did you find the most difficult?
6. Evaluate your participation in group work. Did you participate? What difficulties did you have?
7. Which of the other groups' routes would you like to do? Why?
8. What have you learnt from doing this task?





## WHY THE STUDY OF GEOGRAPHY IS WORTHWHILE

Geography is a practical science that is useful in everyday life. It teaches you, for example, how to get your bearings with the help of the Sun and the stars, how to interpret and use maps to navigate and/or recognise key area features and how to identify different climatic features and understand climate trends. It also teaches you skills you can apply in other areas of study and the workplace, such as how to analyse and interpret graphs and charts. Through Geography you will come to understand when, how and why phenomena such as rain, snow, waves, tides and earthquakes are produced. You will also learn to recognise and understand the physical characteristics of different regions, as well as the reasons for and extent of economic development in those regions, and how regional populations have developed and are distributed.

### Apply

1. Relate the following concepts to their appropriate branch of Geography:
  - Spanish provinces
  - Wind patterns in the South Pacific
  - Differences between rural and urban habitats
  - Amazon river flow
  - Economic sectors
  - The population of young people in Morocco
  - Topographical modelling
2. Explain, in your own words, what Geographic Information Technologies are, covering the three different types geographers use.

### Analyse

3. Look at the photos on this page: describe them and indicate what economic activities are carried out in each of the different geographical settings.

### Create

4. Now having read these two pages, write a short introduction to the field of geography, explaining:
  - What geography is.
  - What the three branches of geography are.
  - The key tools of the discipline.
  - Its usefulness and relevance to work and everyday life.



# 2

## RELIEF

### Final task



### The imprint of time on relief

Knowledge about relief has been extremely important for economic activity and the survival of societies. A good way to learn about relief is to observe and analyse it. Relief shows us how it was formed and what or who has slowly and continually changed it over time.

The photo on the right is a good example. The action of water on the rock has shaped these formations that look like enormous stone mushrooms. They are part of the *Ciudad Encantada*, in the province of Cuenca (Castilla-La Mancha).



Have you noticed landforms in the landscapes around you? Have you asked yourself how they were formed? Imagine that the *National Geographic* wants you to do a report about the relief in an area near you. You and your team will be asked to choose an area of relief near where you live and identify the affects that different natural and human agents have had on it.





### How relief was formed

- The **lithosphere** is made up of the crust and the upper part of the mantle.
- The **tectonic plates** move over the **mantle** slowly and continuously. The plates can separate or collide.
- The process of tectonic-plate movement that forms mountains is called **orogeny**.

### The shaping of relief

- The main agent in shaping relief is **water**; both marine and continental water, in a liquid or solid state.
- Other agents which help shape relief are the **wind**, **extreme temperatures** and the action of human beings.

### Types of relief on Earth

- **Continental relief** occupies most of the emerged land. Horizontal landforms predominate (plains, plateaus and valleys).
- **Coastal relief** is shaped by agents from oceans and continents.
  - The main **coastal landforms** are cliffs and beaches.
  - The **coastline** has areas that project into the sea (caples) or the sea indents into the land (gulfs, bays and coves). Islands, archipelagos and peninsulas are off the coast.
  - Some **coastal landforms** are created by the action of rivers, such as deltas, rias, estuaries, lagoons and marshes.
- The relief of the **ocean floor** is formed by the continental shelf, the continental slope and the abyssal plain, where deep ocean trenches and ocean ridges (mountain ranges) are found.

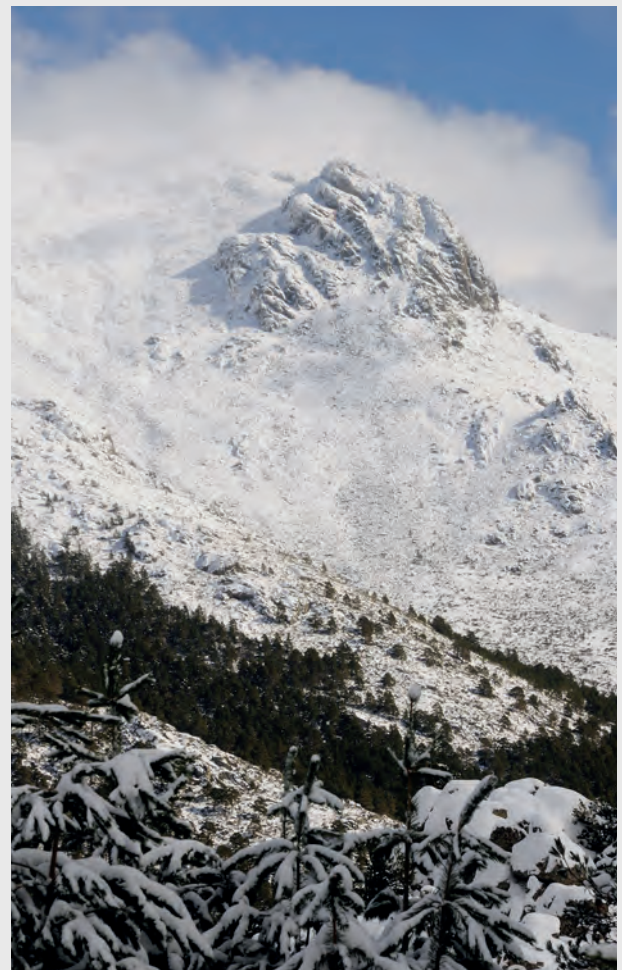
### Geological hazards

The forces of the Earth's interior can cause catastrophic damage.

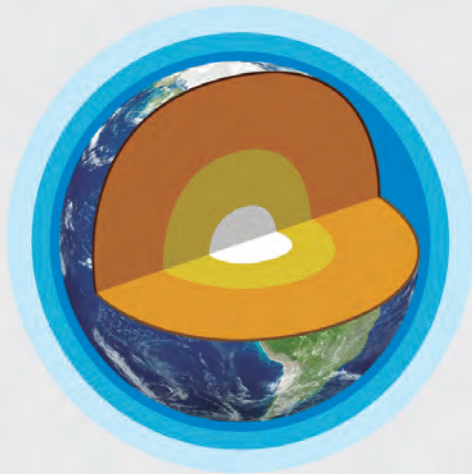
- **Volcanoes** are landforms created by the emission of molten materials (lava), ash and gases to the surface from the interior of the Earth's crust.
- **Earthquakes** are sudden powerful movements of the Earth's crust, caused by the liberation of energy from the Earth's interior in the form of seismic waves. The shaking and the fractures in the ground can cause serious damage to buildings. The intensity of an earthquake is measured on the Richter scale.
- **Tidal waves** are caused by earthquakes under the sea and can produce enormous waves called **tsunamis**. If a tsunami reaches the coast, it can cause catastrophic damage.

### THE STRUCTURE OF THE EARTH

- The Earth is made up of three layers: the **crust**, **mantle** and **core**.
- The **crust** is the external layer of the Earth. This layer is not smooth. There are plains, valleys, depressions and mountains on the surface. All these geographical features together are called relief.
- In the **inner core**, materials are in a solid state. In the **outer core** and the **mantle**, rocks are molten, called **magma**.



1. Draw this illustration of the Earth in your notebook. Label the different layers of the Earth and write a brief explanation for each one.



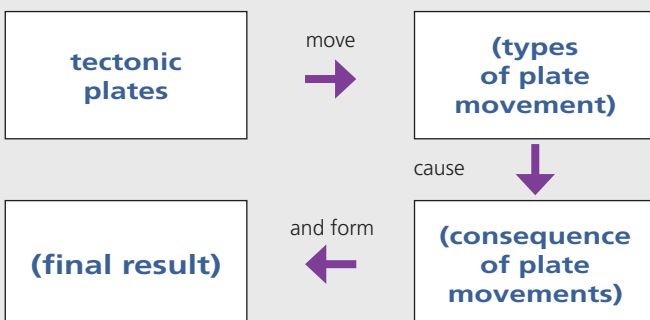
2. Write definitions for the following terms:

- continental shelf
- lagoon
- bay
- epicentre
- isthmus
- plateau
- moraine
- tectonic plate
- lava
- aeolian relief

3. Match each landform with the corresponding type of relief with a tick (✓).

|         | Continental | Coastal | Submarine |
|---------|-------------|---------|-----------|
| ridge   |             |         |           |
| delta   |             |         |           |
| isthmus |             |         |           |
| gorge   |             |         |           |
| glacier |             |         |           |
| trench  |             |         |           |
| plateau |             |         |           |
| gulf    |             |         |           |

4. Copy and complete the flow chart of the formation of relief.



5. Identify the following landforms in the illustration.

- beach
- delta
- cliff
- sierra
- gorge
- mountain range
- glacier
- volcano
- river
- plateau
- valley
- gulf
- hill
- archipelago
- cape



6. Match each term with the corresponding geological hazard.

|           |            |
|-----------|------------|
| lava      |            |
| epicentre |            |
| ash       |            |
| crater    | earthquake |
| Richter   | volcano    |
| tsunami   |            |
| chimney   |            |
| Vesuvian  |            |

7. Look at the photo. What is this phenomenon? What creates it and what damage does it cause?







8. Find out about the location of these volcanic landforms. Indicate the province, the autonomous community of each one and their main characteristics.



Sant Margarita volcano, Olot



Volcanic rock, Cabo de Gata



Mount Teide volcano, Tenerife



Teneguía volcano, La Palma island

9. Look at the aerial view of the San Andreas fault.

- Find out where it's located.
- Explain how it was formed.
- List its main characteristics.
- Name some geological hazards that it could cause and explain their characteristics.



10. Answer these questions about the ocean floor.

- What is an ocean ridge and an ocean trench?
- What phenomenon can occur under the sea in the areas of contact between tectonic plates?
- What geological hazards originate on the ocean floor?

11. An example of the action of rivers is the formation of canyons and gorges. Look for information on the Internet about major canyons and gorges in Spain. Explain where they are and which river formed them.

12. Copy and complete the table in your notebook.

|       | Similarities | Differences |
|-------|--------------|-------------|
| Fold  |              |             |
| Fault |              |             |

13. Read the text and answer the questions.

#### Two big earthquakes hit Lorca

The southern Spanish town of Lorca, Murcia, was hit by a major earthquake, killing at least 10 people and injuring 167. Some 20 000 residents have spent the night outside, afraid of another earthquake and collapsing buildings. The earthquake registered 5.2 on the Richter scale. Several buildings fell, crushing cars and a hospital was evacuated as a precaution. Spain has hundreds of earthquakes every year, but most of them are too small to be noticed. Murcia is close to a large fault line beneath the Mediterranean Sea where the European and African continents meet.

BBC News, 12 May, 2011  
(Adapted)

- Which autonomous community does Lorca belong to?
- Why did the residents of Lorca spend the night outside?
- Why is the risk of an earthquake occurring greater in Murcia?
- What are the effects of an earthquake on a town and its residents?

14. You are going on a hiking trip and you have a map with your route marked. You need to be clear about the landforms on your route. Make a fact file for each pair of landforms below. Draw and label the landforms, and indicate the differences between them.

- Hill and mountain
- Gulf and cape
- Island and peninsula
- Lagoon and marsh
- Marsh and estuary



# The imprint of time on relief

Imagine that *National Geographic* (the famous geography, archaeology and natural science magazine) wants to write a report about the relief in the area where you live and requests your collaboration. Choose an area of relief where you live and analyse its main characteristics, its origin and the different natural and human agents that have modified it over time.



In groups or individually

## MATERIALS

- Notebook
- Card, glue
- Computer with Internet access

## Preparation



Work in groups. Share the information you have collected in the unit activities and choose the area you are going to investigate.

You can obtain information from the Internet and if you have the opportunity, visit the place accompanied by an adult.



Consult the *Geological Heritage* web page.

## Procedure



Follow these steps to carry out your research:

### 1. Describe the relief you have chosen

First, identify the different areas in your chosen relief, and the characteristic features, both natural and man-made. In the photo below you can distinguish four areas:



### 2. Determine the agents that have influenced the relief

Ask yourselves which agents have been involved in the formation of the relief (orogeny, volcanoes, earthquakes, rivers, glaciers, sea, wind, etc.). How have these agents shaped the relief?

For example, in the relief shown in the photo above, the main agent is the water in the river and the secondary agent is human action that has modified the fluvial terraces and reduced the forest area to cultivate fields of crops.



Each group can analyse the landscape from each perspective and follow all the steps or concentrate on one only. Give your report a title.



### 3. Explain your area of relief

In the river in the photo, the riverbed has formed different levels of terraces. The older terraces are higher; and the more recent terraces are lower, near the river. This is because the river cuts through the earth, transporting and depositing materials.

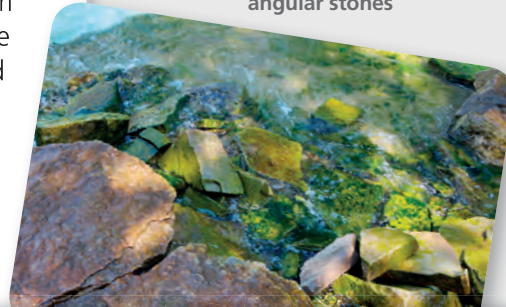
### 4. Analysis of some elements

In the relief in the photo, the fluvial deposits in the riverbed could be analysed. In the photo on the right, the angular stones indicate that they have been removed from areas nearby and relatively recently, because they have barely been eroded by the river. In contrast, the pebbles (rounded stones) show us that the water has carried them for longer and they come from further away. In the relief of the photo, the fluvial deposits are pebbles, gravel, sand and clay.

In a cliff, we could analyse the tides, the strength of the waves, ... in a karst cave, we could observe the amount of water that is visible, the length of the stalactites and stalagmites, and so on.



Pebbles (above) and angular stones



### Communication and publication



Once the information is compiled, make a mural to help you present your work to the class. Imagine that experts from the *National Geographic* will be attending your presentation.

The mural should include the following elements:

- A photograph of the relief that you have analysed.
- A fact file about the photo which includes information about the areas and the features that distinguish them, the agents that have been involved and the resulting relief.

You could make a digital mural and post it on the class blog. You can use *Glogster* (or a similar application) and include text, images and videos.

#### ANALYSIS OF A TYPE OF RELIEF

- **Different units:** riverbed, terraces, mountain slope.
- **Analysis of some elements:** fluvial deposits in the form of pebbles, gravel, sand and clay.
- **Agents that have been involved:** water, human beings.
- **Resulting relief:** fluvial terraces of different levels, ravines and gullies.



## SELF-ASSESSMENT



1. What aspects do you think are essential in the description of a type of relief?
2. What factors have been involved in the formation of this relief? How have humans affected it?
3. What do you think the place you chose will be like after a lot of time has passed?
4. Explain why you chose this area for your task.
5. Which of the types of relief chosen by other groups caught your attention the most?
6. Make a list of all the sensations related to sight, hearing and smell that the places chosen by the different groups have transmitted.
7. What have you learned from the other groups' presentations?
8. What have you learned from working in a group? What did you contribute to the success of your group's work?



# 3

## WATER ON EARTH

Final task



### Drop by drop... it's disappearing.

Water is the source of life, but the scarcity of water is one of the biggest challenges facing many societies today.

Spain has great geographical diversity due to its varied climate and relief. In Spain, there is no water scarcity, but rather an unbalanced distribution, which requires hydraulic works such as wells, dams and water channels. However, there is sometimes water scarcity due to pollution and overconsumption.



What would happen if your town experienced a serious drought and your consumption of water was severely restricted? What if there was no drinking water? What measures would you have to adopt? In this unit, you will be part of a panel of experts dealing with water scarcity. You will participate in round-table discussions about these and other questions, to come up with ideas to use and preserve available water sources.





### The oceans and seas

- The oceans and seas cover two-thirds of the Earth's surface. The oceans are the **Atlantic**, the **Pacific**, the **Indian**, the **Arctic** and the **Southern**.
- The movements of the water in the seas and oceans are **ocean currents**, **tides** and **waves**.



### WATER ON THE EARTH

- All the water on the Earth makes up the **hydrosphere**.
- Most of the water on Earth is in a **liquid state**, but it also appears in the form of **vapour**, **ice** and **snow**.
- Most of the water on Earth is **salt water** and is found in the **oceans** and **seas**.
- **Fresh water** is essential for animal and plant **life**, but it is only 3% of the total water on Earth.
- **Rivers** hold a very small percentage of the surface water on Earth. As rivers provide the water we consume, it is essential that we keep them in good condition, without polluting them, and that we use this scarce resource responsibly.

### Continental waters

- Continental waters are rivers, lakes, groundwater and glaciers.
- **Rivers** are continuous currents of water.
- **Groundwater** is created by enormous deposits under the Earth's surface, called **aquifers**. Water is extracted from wells.
- **Lakes** are large bodies of permanent still water.
- **Glaciers** are large bodies of ice that cover the polar regions and mountain summits.



### The importance of rivers and seas for humans

- **Rivers** were fundamental to the development of the first civilisations.
- Most major **cities** are located next to a **river**.
- The **seas** are important **means of communication** and provide important resources for the **development** of human societies.

### Risks and dangers related to water

- Both the scarcity and the excess of water can cause **disasters** (**floods** and **droughts**).
- Floods can cause serious damage to towns, villages and crops. An extended drought can cause the death of people and animals and the disappearance of vegetation.



- Find Europe on the map below and locate the following seas and rivers:
  - Baltic Sea.
  - River Rhine.
  - Volga river.
  - Black Sea.
  - North Sea.
  - River Danube.
- Look at the map of Europe, or another with more detail. Follow the course of the Danube River. Identify:
  - the countries the river crosses
  - the cities located on its banks
  - the sea it flows into



- On the map above, you can see that Europe has many rivers. Explain why. Where are the longest European rivers? Explain why.
- Look at a physical map of North America. Why are there cities on the northern coasts of the European continent, but not on the far northern coast of North America?
- Make a fact file in your notebook with the differences between the upper, middle and lower courses of a river. Include the following factors:
  - Flow rate
  - Incline and speed
  - The main action of the river in each course (erosion, transportation or sedimentation)
  - Uses (if there are any)

Include a drawing of a river and its different courses.

- Look at the photo of an area of Aragón. What has happened? What caused it? What damage does it cause?







7. Look at the photo and answer the questions.

- Where is this type of lake found?
- Where is its source?
- Where are there many lakes like this in Spain?



8. Look at the image below and find out about the formation shown.

- What it is called?
- Where are these formations found?
- How is it formed?
- What percentage of its mass is above the surface of the water?
- What historical disaster was caused by one of these formations?



9. Copy and complete the sentences in your notebook.

- The quantity of water that is carried by a river at a specific point in its course is called the \_\_\_\_\_.
- Salt water constitutes \_\_\_\_\_ % of the water on the planet. It is found in \_\_\_\_\_ and \_\_\_\_\_.
- The movements of water in the seas \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- Floods can be caused by extreme weather phenomena such as \_\_\_\_\_ and \_\_\_\_\_.

10. Read the following text about a natural disaster which had catastrophic consequences. Analyse the phenomenon and explain how it was caused and how it could have been avoided.

On 7th of August, 1966, a summer storm hit the town of Biescas (Huesca) located in a valley in the Pyrenees. The Arás torrent, next to *Las Nieves* campsite, increased its flow rate very quickly as a result of the 160 mm of rainfall produced by the storm in a very short time. The flood that was caused pulled masses of rocks and trees along with it, down the steep slopes and valleys.

In the end, the water destroyed the campsite causing 87 deaths and 183 people were injured in one of the worst flood disasters in Spain ever.



11. Read the following quote by Arthur Clarke, British author of *2001: A Space Odyssey* and write comments.

*How inappropriate to call this planet Earth, when it clearly should be called Ocean.*

12. Write a paragraph explaining your thoughts on how we use water and its importance for humans and for life on Earth.

# Drop by drop... it's disappearing

Imagine that in the area where you live there is a period of prolonged drought and that the supply of drinking water may soon be at risk. You are going to form a round table of experts to examine the situation and propose different measures of conserving and using the available water.



In big groups or individually

## MATERIALS

- Card or continuous paper
- Felt-tip pens
- Notebooks
- Computer with Internet access

## Preparation



Form teams of experts of four or five students. Each one represents a specific segment of the population or people who work in services that use water. These could be:

- A farmer who needs to water his crops.
- The manager of a water park who needs water to fill the swimming pools.
- A family who needs water to drink, clean the house, wash clothes, shower, ...
- The town hall that needs water for the gardens, streets and fountains.

## Procedure

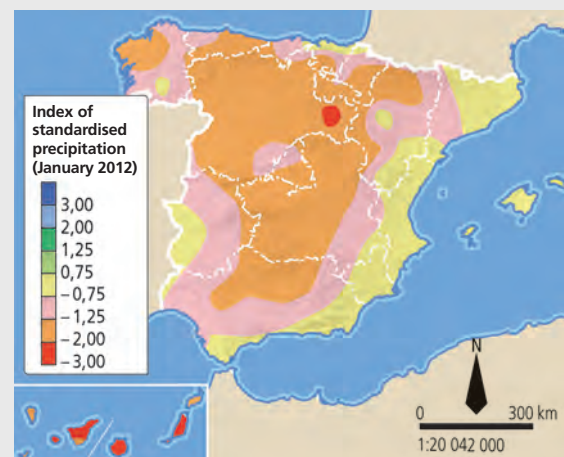


1. Begin by reflecting on the need for water in the world. If you can, find out about the United Nations Millennium Development Goals. Goal 7C is related to access to drinking water.
2. Look for information on the importance of water in general for our society. For example, news related to water scarcity in Spain and the areas which have been most badly affected throughout history and the implications, especially in the summer months, when there is more risk of drought and forest fires.
3. Decide which group of the population or service that uses water your group will represent. Then, analyse the consequences of water restrictions. For example:
  - Farmers would lose crops that would put their livelihood in danger.
  - Water parks and public pools would close, which would affect our leisure activities and our enjoyment at the hottest times of the year.
  - The lack of water to drink, to clean homes and for personal hygiene could affect our health.



*Water is essential for the survival and well-being of humans, and it's important for many sectors of the economy. Water resources are distributed unevenly in space and time, and are overused due to human activities. How can we satisfy a demand that grows every day?*

*Summary of the second report from the United Nations on the development of water resources in the world: Water, a shared responsibility*



Source: <http://inicia.oupe.es/gf1ebi0305>





# Final task



4. Find out which types of water resources there are in your area (fresh water that is found in rivers, streams, aquifers, reservoirs, lagoons, etc.), and investigate how it is exploited and how much water is supplied. For example, do you know why dams and reservoirs are built?
5. Find a water treatment or wastewater treatment plant near your town, make notes on how it works, and reflect on the importance it has for daily life.
6. Look for examples of misuse of water and think about ways that help to resolve or reduce the dangers of the situation, so that people can continue using it as a basic resource that can be shared and conserved.



## Communication and Publication



With the information obtained, each group will make a poster with images and texts showing the importance of water in our daily life and the methods we can take to use and conserve it. Include the most original and creative slogans your group has written. The posters will be exhibited in the classroom and later a round table will be formed to share the information obtained. One student will take notes and make one list of the measures each group proposes to save water. This list will be hung next to the posters, visible to everyone.



## SELF-ASSESSMENT



1. List the uses of water.
2. What relationship does water have to our health?
3. Explain where drinking water comes from and how it gets to your home.
4. What arguments would you use to convince someone of the importance of not wasting water?
5. Make a list of possible actions that can be taken to make use of and conserve water resources where you live.
6. Which of the posters that the groups have made do you like the most? Why?
7. What have you learned from the posters and the information presented by the other groups at the round table?
8. How did you work in your group? How have you contributed to the success of the task?

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## AUTHORS

Ángel Navarro Madrid  
Miguel Ángel Alcolea Moratilla  
Francisco José Ayén Sánchez

**Autonomous community content:** Celia Carrasco Márquez, Genaro González Carballo, Juan Luis González Carballo, María Guadalupe Sierra Padilla, Francisco Torres Escobar, María Isabel Fernández Armijo

## ADAPTORS OF THE ENGLISH EDITION

Donna Lee Fields  
Annabel Jane Maybank

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**Interiors:** Dolors Albareda

## PHOTOGRAPHS

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