

Expanded Guide: Climate and Earth – A Journey Through Nature (For Kids, Age 12, Spain)

Weather vs. Climate – Understanding the Basics

- **Weather** is what you see outside today—like if it's sunny, raining, or windy. It changes from hour to hour and day to day.
- **Climate** is the average weather in a place over a long time, usually 30 years or more. For example, Madrid usually has warm, dry summers and cool, rainy winters—that's its climate^[1].

Activity:

Be a Weather Reporter!

Pick a Spanish city (like Barcelona or Seville) and write a weather report for today. Then, research what the climate is usually like there. Is it Mediterranean, oceanic, or continental? Why?

Vocabulary:

- **Forecast:** A prediction about the weather.
- **Temperature:** How hot or cold it is.
- **Precipitation:** Rain, snow, sleet, or hail.

The Elements of Climate – The Magic Mix

Climate is made up of four main ingredients^[1]:

- **Temperature:** Changes with the seasons, time of day, altitude (height above sea level), and latitude (how far you are from the Equator).
- **Precipitation:** Some places in Spain, like Galicia, get lots of rain, while others, like Almería, are very dry.
- **Wind:** Moves clouds and heat. Winds like the Levante or Tramontana are famous in Spain.
- **Air Pressure:** High or low pressure affects if we get storms or calm weather.

Did You Know?

Spain's highest recorded temperature was 47.6°C in Córdoba!

Why Does Climate Change From Place to Place?

Several factors make climates different across Spain and the world^[1]:

- **Latitude:** The closer to the Equator, the hotter it is. The Canary Islands are warmer than the Pyrenees.
- **Distance to the Sea:** Cities near the sea (like Valencia) have milder climates and more rain than inland cities (like Madrid).
- **Altitude:** Higher places (like Sierra Nevada) are colder.
- **Winds and Currents:** Winds like the Levante, and ocean currents, affect local climates.

Game:

Climate Detective

Use a map of Spain. Guess the climate of cities like Bilbao, Málaga, and Salamanca. What clues help you decide?

Zone	Temperature	Spanish Examples	Vegetation
Mediterranean	Warm, dry summers	Barcelona, Valencia	Olive trees, pine forests
Oceanic	Mild, rainy	Bilbao, Santiago	Lush green forests
Continental	Hot summers, cold winters	Madrid, Zaragoza	Holm oaks, fields
Mountain	Cold, snowy	Pyrenees, Sierra Nevada	Pine forests, alpine plants
Subtropical	Warm all year	Canary Islands	Palm trees, laurel forests

Challenge:

Which climate zone do you live in? Why do you think so?

How Nature Shapes the Land

Water's Superpowers:

- Rivers like the Ebro carve valleys and canyons.
- Rain dissolves rocks, creating caves (like those in Cantabria).
- Waves shape the coast, forming beaches and sea arches (like Playa de las Catedrales in Galicia).
- Ice in the mountains breaks rocks apart when it freezes^[1].

Story:

The Tagus River has shaped central Spain's landscape for thousands of years.

The Power of Wind

Wind shapes rocks, moves sand, and creates dunes—like those in Doñana National Park^[1].

Mini Project:

Make a mini sand dune at home using flour and a straw. Blow gently and watch how the “wind” shapes your dune.

Humans Change the Landscape

Humans have a big impact on the land:

- Cutting down forests (deforestation)
- Building cities and roads (urbanization)
- Farming and mining
- Causing wildfires

These actions can cause erosion, pollution, and loss of biodiversity^[1].

Debate:

Should we stop building in wild areas to protect nature? Why or why not?

Global Warming & Climate Change (Spanish Context)

What's happening?

- Spain is warming faster than the global average.
- Glaciers in the Pyrenees are melting.
- Droughts, heatwaves, and wildfires are more common.
- Sea levels are rising, threatening coastal areas.

Experiment:

Greenhouse Effect in a Jar

- Place two thermometers in the sun. Cover one with a glass jar. After 20 minutes, compare the temperatures. The jar traps more heat—like greenhouse gases in Earth’s atmosphere^[2].

Activity:

Ice Melting and Sea Level Rise

- Put ice cubes in two containers. In one, place the ice on top of some play dough (to represent land), and in the other, just in water. Watch how melting ice on “land” raises the water level more than ice already floating in water^[2].

Fun Activities and Games

- **Kahoot Quizzes:** Guess the climate zone, Water/Wind/Human?, Weather vs. Climate^[1].
- **Board Game:** "Climate Explorer"—collect gear for each Spanish climate zone.
- **Map Activity:** Color Spain's main climate zones and add rivers, mountains, and deserts^[1].
- **Weather Station:** Build your own with a rain gauge, wind vane, and thermometer to track local weather^[3].
- **Be a Climate Detective:** Join projects like ESA's Climate Detectives Kids to do real science and earn badges^[4].

Why Does This Matter?

Climate and geography affect our homes, food, clothes, and future. By understanding them, we can:

- Predict storms and droughts
- Grow the right crops
- Protect Spain's unique plants and animals
- Take care of our country and planet for future generations^[1] ^[4] ^[2]

Useful Links and Resources (Spain)

- **AEMET:** Spanish weather and climate data
- **MITECO:** Ministry for the Ecological Transition (climate policies)
- **ESA Climate Detectives Kids:** Real science activities for students^[4]
- **NASA Climate Kids:** Fun facts and experiments

Explore, experiment, and be curious—your discoveries help protect our world!

