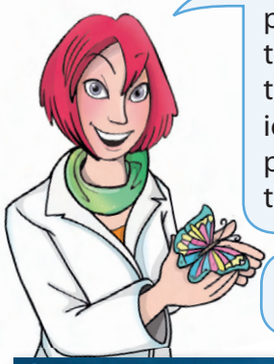
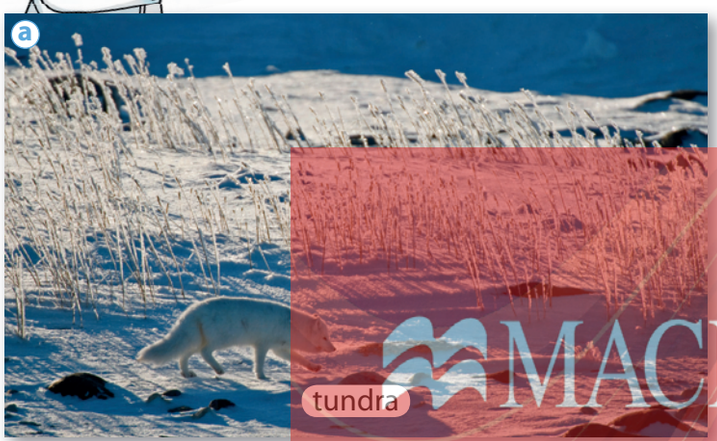
1 Ecosystems — World biomes



Have you ever travelled to another part of the world? The climate can be very different in other places and you can see different plants and animals, too. A large area where plants and animals live together is called a biome and scientists have identified seven types of biome on our planet. The plants and animals in each biome are adapted to the temperature and precipitation in their environment.

Which plants and animals can you find in these biomes?

a



tundra

b

Mediterranean

c

tropical rainforest

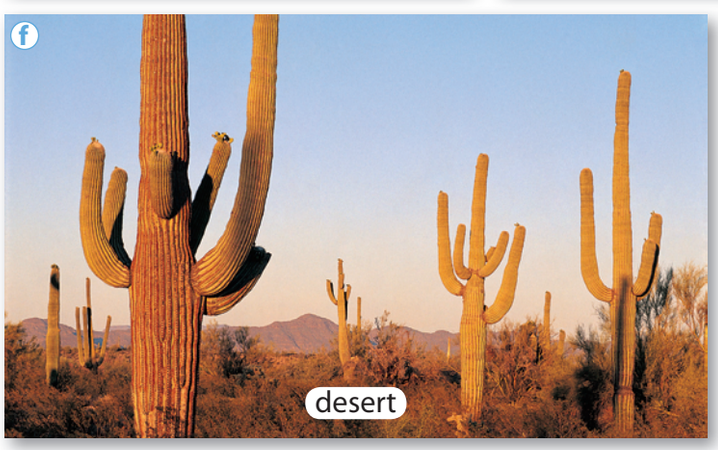
d

grasslands

e

temperate deciduous forest

f



desert

g

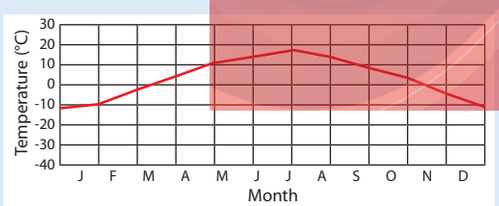
coniferous forest

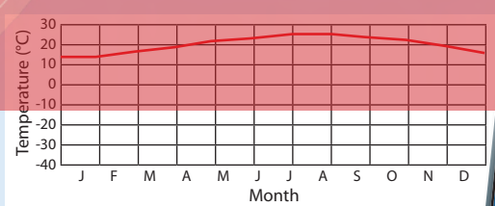
SCIENCE INVESTIGATION NOTES

The world's biomes

Biome	Temperature	Precipitation	Typical flora	Typical fauna
Tundra	cool summers and very cold winters	150 to 250 mm rain each year	lichen, moss, some grasses	migratory birds in summer, Arctic foxes
Mediterranean	hot summers and cool winters	200 to 1,000 mm rain each year	aromatic herbs, shrubs, grasses	wild goats, rodents, lizards
Tropical rainforest	warm temperatures all year	2,000 to 10,000 mm rain each year	evergreen trees, orchids, ferns	anteaters, jaguars, butterflies
Grasslands	depending on latitude between -20°C and 30°C	500 to 900 mm rain each year	large areas of grasses, crops	antelopes, sheep, cattle
Temperate deciduous forest	hot summers and cold winters	750 to 1,500 mm rain each year	deciduous trees, shrubs, mosses	deer, squirrels, foxes
Desert	warm and hot daytime temperatures all year	less than 250 mm rain each year	cacti, small bushes	lizards, snakes, scorpions
Coniferous forest	cool summers and cold winters	300 to 900 mm rain each year	evergreen coniferous trees	bears, wolves, beavers

1 CD1 2 **Listen and read the *Science investigation notes*. Look at the graphs and identify the biomes.**





a This is a **tropical rainforest** / **Mediterranean** / **temperate deciduous forest** biome.

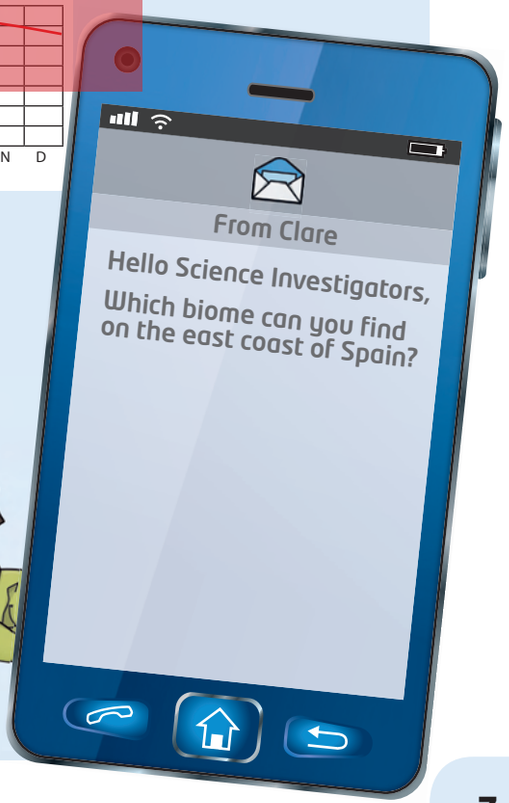
b This is a **desert** / **tundra** / **coniferous forest** biome.

2 CD1 3 **Say *The world's biomes* chant.**

3 **Describe and identify the different biomes.**

In this biome there are warm temperatures all year and there's a lot of precipitation. You can see orchids, ferns, anteaters and jaguars here.

It's a tropical rainforest biome.



4 SI **Answer the question for the Science Investigators.**

- Answer to the Science Investigators' question on Wiki Discovery page 150.
- Dictionary definition on Wiki Dictionary definitions page 174.

Interaction in ecosystems

CD 1 4

An **ecosystem** is the interaction between all the living and non-living things in an area.

An ecosystem can be as small as a leaf or as large as a forest. A large ecosystem can contain smaller ecosystems. A tree can be an ecosystem but at the same time, it's part of the forest ecosystem.

Ecosystems have two main components:

Living things: All the plant life in an ecosystem is called the **flora**. All the animal life in an ecosystem is called the **fauna**. Other living things in an ecosystem are **fungi** and **microorganisms**, such as bacteria.

The environment: The environment is made up of all the physical elements in the area where the living things are. Physical elements in an environment include air, water, soil, sunlight, temperature and climate.

Organisms in one area that belong to the same species are called a **population**. When populations interact with each other, they form a **community**. These communities interact with each other and the environment.

Answer the question for the Science Investigators.

How big or small can an ecosystem be?

1 **Identify the flora and fauna in ecosystem a. What other living things can you identify?**

2 **Copy and complete the sentences.**

a The _____ is all the animal life and the _____ is all the plant life in an ecosystem. _____ and _____, such as bacteria, are other living things in an ecosystem.

b The _____ is made up of all the physical elements in the area where the living things are.

c A _____ is the organisms in an area that belong to the same species.

d When populations interact with each other, they form a _____.

3 **Copy and answer the questions.**

a Look at photo b of the desert. What flora and fauna do you think can live in this ecosystem?

b How have the flora and fauna adapted to this environment?

4 **What must the environment provide for living things?**

5 **Living things can also affect the environment. How do they do this?**

• Answer to the Science Investigators' question on Wiki Discovery page 150.

Food chains and food webs


producer


primary consumer


secondary consumer


tertiary consumer


decomposer

CD1 5

One of the most important relationships between living things in an ecosystem involves energy. Every organism needs energy in order to live. Energy moves through an ecosystem through **food chains** and **food webs**. All food chains begin with energy from the Sun.

What makes up a food chain?

Producers make their own food. Plants and some protists are producers.

Consumers obtain their food by eating other living things.

Primary consumers eat producers. Herbivores and omnivores are primary consumers.

Secondary consumers eat primary consumers. Carnivores and omnivores are secondary consumers. In an ecosystem, the same animal can be both **predator** and **prey**.

Tertiary consumers eat secondary consumers. They can be a predator that eats a secondary consumer or they can be a parasite which feeds on but doesn't kill the secondary consumer.

Decomposers live on the remains of other living things. Most decomposers are fungi and bacteria.

CD1 6

Most living things are part of more than one food chain. There can be many different food chains in an ecosystem and most of these food chains are connected. The connected food chains make up a **food web**.

Answer the question for the Science Investigators.

How are food chains and food webs different?

1 Write the definitions.

producer consumer decomposer parasite

2 Draw a food chain using the organisms in the box and identify the producer and the primary, secondary and tertiary consumers in it.

diving beetle fish tadpole
fungi heron pond weed

a What will happen if the pond weed disappears from this food chain?
b What will happen if the heron disappears from this food chain?

3 Work with a partner to prepare a different food chain which consists of a producer, a primary consumer, a secondary consumer, a tertiary consumer and a decomposer.

4 Can you use these food chains to make a food web?

5 Can you think of an animal which is both a primary consumer and a secondary consumer?

6 Sing the *Food Chain* song. CD1 7

• Answer to the Science Investigators' question on Wiki Discovery page 151.
• Dictionary definition on Wiki Dictionary definitions page 174.

Ecosystems, the environment and humans

CD1 8

Humans live almost everywhere on the Earth and they have an enormous effect on the planet and its ecosystems.

Humans have always used the Earth's **natural resources** for the things they need. Today, because of the increase in population and the development of industry, we are taking more natural resources from the Earth. Cutting down trees has caused **deforestation** in many areas and put many plants and animals in danger of extinction.

All changes in the natural environment can be harmful to the flora and fauna in an ecosystem. It's important to remember that if one link in a food chain disappears, it will affect the food web. Today, many species of plants and animals are endangered and may soon be extinct.

a 

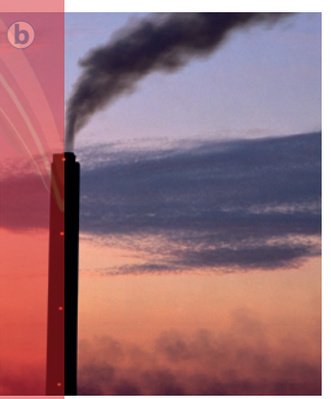
CD1 9

Pollution is one of the most important environmental problems on the Earth. Pollution is the **contamination** of the Earth's **air**, **soil** and **water**.

When coal burns, sulphur in the coal reacts with oxygen in the air to form strong acids. When petrol burns, the heat makes nitrogen and oxygen in the air react to form more strong acids. These acids dissolve in rain forming **acid rain**. This damages trees and erodes some buildings and historical sculptures. The burning of fossil fuels also adds carbon dioxide to the atmosphere, contributing to the **greenhouse effect** and causing global warming.

Soil is polluted by harmful substances, such as chemicals from agriculture and waste from industries and homes.

Water pollution can happen when waste is deposited in rivers, lakes and seas. Water can also be polluted by acid rain, which can harm or kill flora and fauna in a water habitat.

b 

Answer the question for the Science Investigators. Why are our cities so polluted?

1 **Can you think of examples of how humans change the landscape?**

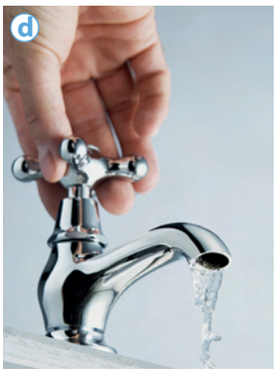
2 **Copy the chart about pollution and complete the middle column.**

Type of pollution	Cause	Effect
Air		
Water		
Soil		

3 **What are the effects of pollution? Discuss and complete the right-hand column in the chart.**

• Answer to the Science Investigators' question on Wiki Discovery page 151.

Protecting the environment



CD1 10

Today, people are trying to protect the environment. There are many **ecological organisations**, both in Spain and worldwide, which can give us information about what is happening to the planet. There are also **political parties** whose policies are dedicated to environmental issues. We must all take responsibility for the environment and remember that we can all help our planet.

CD1 11

Today, governments are more interested in ecological issues and are trying to protect the environment. They can protect areas of land by making them **natural** or **national parks**. Nobody can cut down trees or interfere in any way with the ecosystems in these parks.

Laws protect endangered species by protecting their habitats and by protecting them from hunters. Laws also control pollution from industries and the quality of the air we breathe.

Many governments encourage non-polluting energy, such as solar energy, and they also have campaigns to teach people how to save energy and natural resources.

Answer the question for the Science Investigators. Who can help protect the planet?

1 Match and write the sentences about protecting the environment.

a	When we recycle,	to global warming.
b	Wind energy is	taps can save litres of water.
c	Petrol is contributing	to interfere with the ecosystems inside a natural park.
d	It's illegal	a renewable energy source.
e	Turning off	we save natural resources.

2 Copy the sentences and correct the ones that are false.

a People can build factories in national parks.
b There are laws to protect endangered species.
c Many governments encourage using non-polluting energy sources such as coal and oil.

3 Me **What endangered species are there in the area where you live?**

4 **World Wildlife Fund and Greenpeace are two international organisations working to protect the planet. Find out what problems they are trying to solve in Spain.**

5 Me **What can you do at home and at school to protect the environment?**

• Answer to the Science Investigators' question on Wiki Discovery page 151.

CD1 13

Jellyfish are invertebrates and are cnidarians. They have existed for over 650 million years.

Some scientists think that the number of jellyfish is increasing because of changes in the marine ecosystem. One reason is that there are fewer natural predators, such as tuna fish, because humans have taken too many fish from the sea. Pollution is also a problem because there is less oxygen in the water. Jellyfish can survive in polluted seas, but some of their predators can't. Finally, the temperature of the planet's oceans and seas is rising and tropical jellyfish are moving to places where they couldn't survive before.

All jellyfish have venomous tentacles, which they use to catch their prey. A jellyfish sting can be very painful for humans, but most jellyfish stings are harmless and can be treated by putting some fizzy drink on the sting. However, some jellyfish stings can be deadly if untreated, so if there are dangerous jellyfish, you should find out how to treat their stings before swimming in the sea.

1 CD1 12 **Listen and read the comic. Do you think there are more jellyfish in the sea now?**

2 CD1 13 **Listen and read the text. Copy and complete the sentences.**

a Jellyfish belong to the _____ family.

b Jellyfish use tentacles _____.

c Some scientists think there are _____ jellyfish than before because the _____ is changing.

3 **Are there more jellyfish in the sea now? Copy and complete the explanation.**

warmer fish pollution jellyfish

Some scientists think that there are more _____ because humans have taken too many _____ from the sea and there is more _____. They also think that tropical jellyfish are moving to other seas because the water is _____.

4 Me **Do you know anyone who has been stung by a jellyfish? What did that person do?**

SCIENCE INVESTIGATORS' REPORT

5 **Read the report and copy and match the headings to the paragraphs.**

Flora Climate Fauna Geography Location

The ecosystem of La Serra de Tramuntana

1

La Serra de Tramuntana is a mountain range on the island of Mallorca. It covers 800 square kilometres and is situated on the north-east coast of the island.

2

The area has a Mediterranean climate. The summer months are dry and hot and the winter months are cool and wet. The average precipitation is 1,400 mm each year.

La Serra de Tramuntana

3

The mountain range is approximately 90 km long and its highest peak is 'Puig Major' (1,445 m). There are several valleys which have small, traditional villages and there are canyons and deep caves. The coast is spectacular. There are cliffs which are more than 300 metres high and there are small coves with rocky beaches.

4

La Serra de Tramuntana has typical Mediterranean vegetation. There are wild herbs and flowers and different kinds of shrubs and grasses. There are also large areas of oak trees in the mountains. The ecosystem is home to twenty-five plant species that are only found in La Serra de Tramuntana.

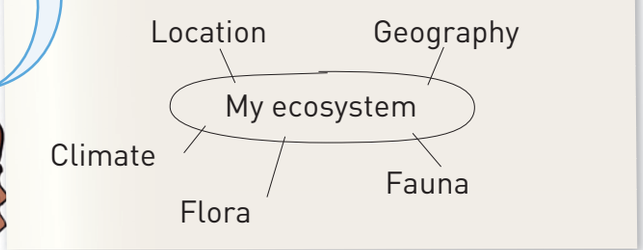
5

There are many interesting and unusual animals in this ecosystem. The rarest animal is the 'ferreret'. This toad was discovered in 1980 and is only found in small pools and streams in La Serra de Tramuntana.

ferreret

6 **Choose an ecosystem. Investigate it and write a description.**

Remember! Organise your notes.



USEFUL LANGUAGE

It's situated ...

The average temperature / precipitation is ...

The ecosystem is home to ...

This animal is found ...

Why don't you find some pictures of your ecosystem and make a poster?

Let's revise!

1 **Copy and complete the sentences about biomes.**

a It's hot and dry in a _____ biome.
b It's warm and humid in a _____ biome.
c It's cold and dry in a _____ biome.
d There are hot summers and cold winters in a _____ biome.
e There are bears, wolves and beavers in a _____ biome.
f There are crops and cattle in a _____ biome.
g There are aromatic herbs and shrubs in a _____ biome.

2 **Copy and match the sentences.**

a Living things are	air, water, soil, sunlight, temperature and climate.
b The environment is made up of	fauna, flora, fungi and microorganisms.

3 **Copy and complete the food web.**

4 **Copy and complete the sentences about humans and the environment. Find the mystery word.**

Can you crack the Science code? Order the letters to discover the mystery word.

Humans have always used the Earth's natural _ _ _ _ _ _ _ _ _ for the things they need.

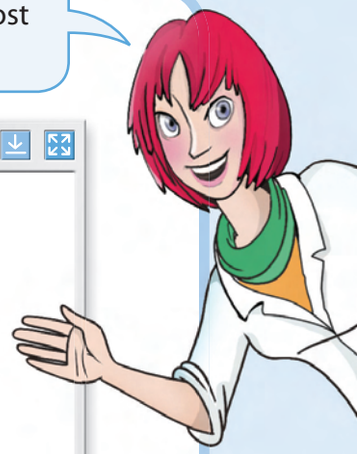
Pollution is the _ _ _ _ _ _ _ _ _ _ _ _ _ _ of Earth's air, soil and water.

When humans cut down and remove trees from large areas of land, it's called _ _ _ _ _ _ _ _ _ _ _ _ _ _ _.

Many animals are in danger because of illegal _ _ _ _ _ _ _.

You can also use the Science Investigator's Wiki on pages 150 and 151 to revise.

Remember! When you take notes, it's important to select the most important information.



5 **Read the text and copy and complete the fact file.**

WWF

WWF is an international organisation which works to protect the natural world. It operates in more than one hundred countries and has more than five million members around the world. WWF uses scientific knowledge to protect the diversity of life on Earth. It protects natural areas and wild populations of plants and animals, and helps communities to live in harmony with nature. It also works hard to inform people about renewable natural resources and how to use the planet's resources more efficiently. Finally, WWF fights to reduce the contamination of the Earth's air, soil and water.

FACT FILE

WWF

Objective: protect the diversity of life on Earth

Protects:

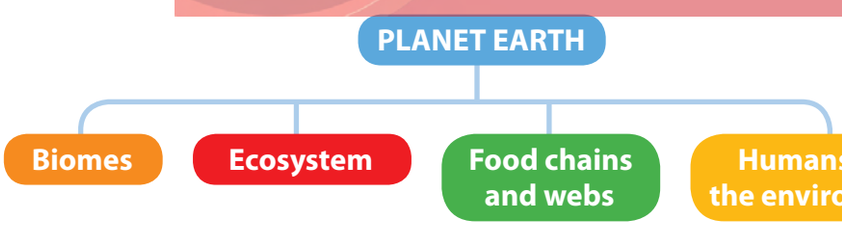
Gives information about:

Fights:

6 **Copy the concept map and add the words.**

tundra primary consumer contamination decomposer community tropical rainforest deforestation population

Now look back at the unit and add more information to your concept map.



7 **Think about what you've learnt in this unit. What can you do now?**

I can identify and describe the seven world biomes.	☆☆☆
I can identify and describe the parts of an ecosystem.	☆☆☆
I can interpret and draw a food web.	☆☆☆
I can describe how humans affect ecosystems.	☆☆☆
I understand the importance of protecting the environment.	☆☆☆

I need to study this a little more. ★ I can do this well. ★★ I can do this very well. ★★★