NEW THINK Do! LEARN

NATURAL SCIENCES

Class Book

3

FOR ANDALUSIA
Think About Andalusia Projects

Oxford
EDUCACIÓN

NATURAL SCIENCES 3

	Contents
1 **Animals**	• Life processes • Classification of living things • Animals • Vertebrate groups • Invertebrate groups • Animal nutrition and reproduction
2 **Plants**	• Parts of a plant • Plant reproduction and nutrition • Types of plants • Ecosystems, habitats and food chains • Looking after our planet
3 **Our systems**	• Our senses and nervous system • Our locomotor system • Our circulatory system • Our respiratory system • Our reproductive system • Our bodies and emotions
4 **Diet, digestion and excretion**	• Our digestive and excretory systems • The nutrients in food • A healthy diet • Healthy habits • Food intolerances and allergies • First aid
5 **Energy**	• Forms of energy • Light and sound energy • Sources of energy • Responsible use of energy and energy saving
6 **Machines and inventions**	• Machines and energy • Computers and the Internet • People and machines • Machines safety • Inventions
Group-work projects	• Endangered animals • Plant detectives • The *Healthy locomotor* game • The *How healthy are you?* quiz • The *Saving Energy* campaign • The *Great Inventions* book

Experiment time!	Let's revise!	Study skills!
The lifecycle of a silkworm	Revision of unit 1	• Concept map of unit 1 • Picture dictionary of unit 1
Beans in a bag!	Revision of unit 2	• Concept map of unit 2 • Picture dictionary of unit 2
The air in our lungs!	Revision of unit 3	• Concept map of unit 3 • Picture dictionary of unit 3
Food digestion	Revision of unit 4	• Concept map of unit 4 • Picture dictionary of unit 4
Travelling light!	Revision of unit 5	• Concept map of unit 5 • Picture dictionary of unit 5
Conductor or insulator?	Revision of unit 6	• Concept map of unit 6 • Picture dictionary of unit 6

UNIT

1

Animals

Objectives

In this unit you will learn about...

- the three life processes of living things.
- the classification of living things.
- vertebrate and invertebrate animals.
- the classification of vertebrates.
- the classification of invertebrates.
- animal nutrition and reproduction.

Experiment time!

Discover how eggs turn into moths!

3

5

6

1. (2) **Listen and say which photo.**

2. Do! **Write three clues for one of the animals in the photos. Play the guessing game with a classmate.**

It's black and white. It has four legs. It's a big animal.

3. Think, pair, share! **In your notebook, write differences and similarities you see in the animals in the photos. Share with a classmate and discuss.**

The turtle is a reptile but the tuna is a fish.
The turtle and the tuna are both oviparous.

Life processes

What does a mouse need to live?

Read and think

1. **Read and find:**

a) three things living things do.

b) three things living things need.

c) three life processes.

Animals, humans and plants are **living things**. They have many things in common.

All living things need **air**.

All living things **grow**.

All living things **die**.

All living things need **water**.

All living things **are born**.

All living things need **food**.

All living things have three life processes: **nutrition**, **interaction** and **reproduction**.

Nutrition

All living things get **nutrients** from food to grow and survive.

For example, a tree makes its own food. A giraffe gets food from the tree.

Interaction

All living things **react** to their **environment** to survive. This is called **interaction**.

For example, a cat chases a mouse and the mouse runs away.

Reproduction

All living things **reproduce** to make more living things of the same type.

For example, humans have babies and eagles have eaglets.

Activities

2. Create **Draw three things that eat, grow and move around. Then answer the questions.**

a) Are they living or non-living things?

b) Are they animals or plants?

3. **In your notebook, write *true* or *false*. Correct the false sentences.**

a) Plants aren't living things.

b) All living things die.

c) Living things don't need food and water.

d) All living things react to their environment.

4. **Copy and complete with the correct life process.**

a) A puppy is born. This is _____.

b) A sheep eats grass. This is _____.

c) Two lions fight over territory. This is _____.

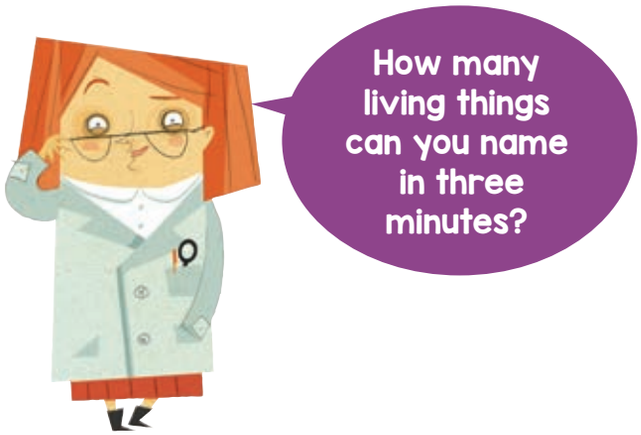
d) A carrot grows from a seed. This is _____.

5. Do! **Draw a picture of a table. Then write six reasons why a table is a non-living thing.**

A table is a non-living thing because it doesn't/isn't...

6. 3 QUIZ **Check your learning.**

Classification of living things



Read and think

1. **Read and find out in which kingdom do living things:**

a) make their own food.

b) rot other living things.

c) move about.

All living things are divided into groups. These groups are called **kingdoms**.

To decide which kingdom a living thing is in you must think about **nutrition** and **interaction**.

Animal Kingdom


A beaver


A dragonfly

Nutrition
Animals eat other living things.


An eagle


A frog


A hyena


A lizard


A snail

Interaction
Animals move about.

Plant Kingdom


An orange tree


A rose


An oak tree

Nutrition
Plants make their own food.

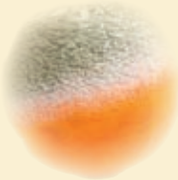

Lavender


Wheat


Grass

Interaction
Plants can't move about.

Fungi Kingdom



Nutrition
Fungi don't make their own food. They rot other living things.

Interaction
Fungi can't move about.

Activities

2. **Copy and complete the sentences in your notebook.**

a) It moves about. It's a _____.

b) It makes its own food. It's a _____.

c) It can't move about. It's a _____.

d) It eats other living things. It's a _____.

e) It rots other living things. It's a _____.

3. Think, pair, share! **Which is the odd one out? Say why. Write more for a classmate.**

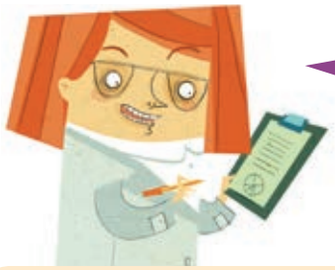
a) crocodile, jellyfish, apple tree, snake, butterfly

b) rose bush, mushroom, wheat, lavender, cactus

4. Do! **Make a poster of the three kingdoms of living things.**

5. 4 QUIZ **Check your learning.**

Animals



What is a skeleton for?

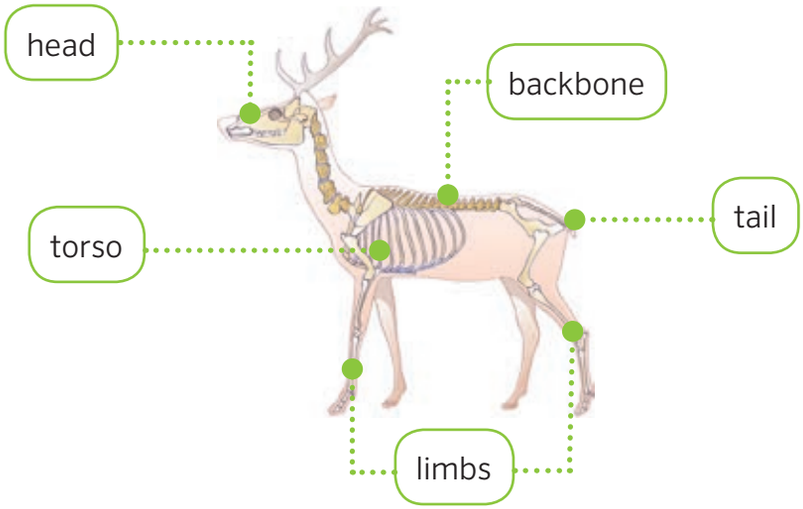
Read and think

1. **Read and find three differences between vertebrates and invertebrates.**

There are many different animals. We can divide them into two main groups: animals that have a **backbone** and animals that don't.

Vertebrates

The name for animals with a backbone is **vertebrates**. They have a **skeleton** inside them. Most vertebrates have a head, a **torso**, **limbs** and a **tail.**



Invertebrates

The name for animals that don't have a backbone is **invertebrates**. They don't have a skeleton inside them. They're usually **smaller** than vertebrates. Why do you think that is?

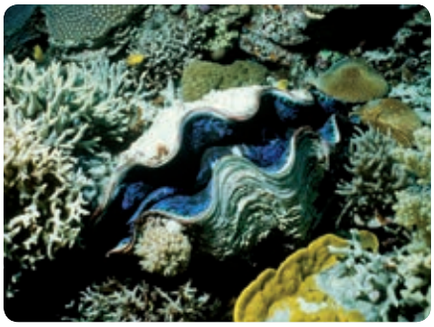
There are many **more** invertebrates than vertebrates.

Invertebrate animals **protect** their bodies in different ways.

Some invertebrates have a **shell** to protect their bodies, for example, snails and oysters.

Butterflies are invertebrates.

Prawns don't have a backbone.



Oysters have a hard shell.

Some invertebrates have an **exoskeleton.** This is **hard** like a skeleton but it's outside the body. Some invertebrates, such as cockroaches, have a **thin** exoskeleton. Some invertebrates, such as crabs, have a **thick** exoskeleton.

Some invertebrates don't have any protection. They have a **soft body**, for example, caterpillars and earthworms.

Cockroaches have a thin exoskeleton.

Crabs have a thick exoskeleton.

Caterpillars have a soft body.

Activities

2. 5 **Listen and repeat. Find the words on the pages.**

vertebrate backbone head torso limbs invertebrate shell exoskeleton

3. Think **Copy and complete the table. Then add two more animals to each column.**

Vertebrates	Invertebrates

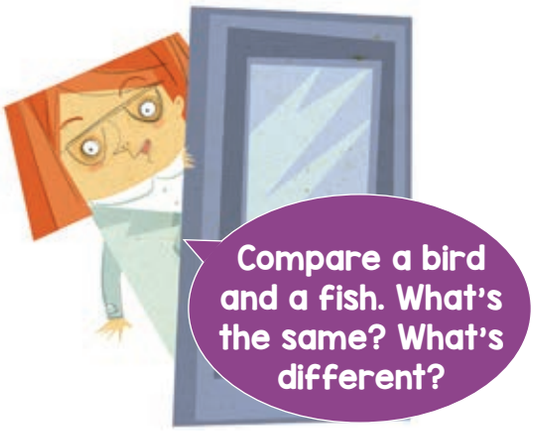
ant pig cockroach rabbit fish butterfly
frog caterpillar bird tiger mosquito

4. **Copy the words and write *shell, exoskeleton* or *no protection*.**

a) caterpillar **c)** oyster **e)** cockroach
b) earthworm **d)** ant **f)** snail

5. 6 QUIZ **Check your learning.**

Vertebrate groups



Read and think

1. **Read and find one or more groups of vertebrates that:**

- **a)** have dry scaly skin.
- **b)** breathe with gills.
- **c)** have feathers.
- **d)** feed their babies with milk.
- **e)** breathe with lungs.
- **f)** live in water and on land.
- **g)** have hair or fur.
- **h)** live on land and in the air.

We can classify vertebrates into five groups: **mammals**, **birds**, **reptiles**, **amphibians** and **fish**. Animals in each group have common characteristics.

Mammals

Mammals have **hair** or **fur**. They breathe with **lungs** and they usually have four legs. Mammals feed their babies with **milk**. Most mammals live on land. Some mammals live in water, for example, dolphins. But only one mammal, the bat, can fly!

Birds

Birds have two wings and are covered with **feathers**. They breathe with lungs. They have two legs. Most birds can **fly**, but penguins can't!

Reptiles

Reptiles have **dry skin** and **scales**. They breathe with lungs. They live on land. Some reptiles have four legs, but some have no legs!

A chimpanzee is a mammal.

A lion is a mammal.

Eagles are birds.

Lizards are reptiles.

Amphibians

Amphibians have **moist skin**. When they're young they breathe with **gills**, but later they develop lungs. They can live on land or in water. Adult amphibians have four legs.

Fish

Fish live in water. They have **scales** and use **fins** to swim. They breathe with **gills**. There are more than 30 000 known types of fish in the world.

A toad is an amphibian.

Sharks are fish.

Activities

2. 7 **Sing the *Vertebrates* song.**

3. 8 **Listen and blend the sounds. Then guess the words.**

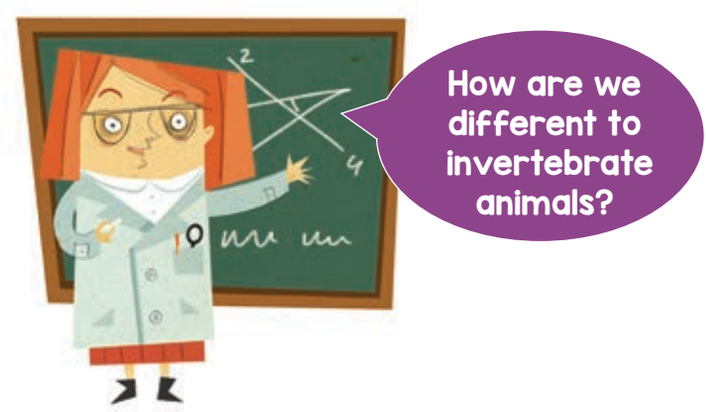
4. Think . . . **Copy and complete the table in your notebook.**

Group	How they breathe	Number of legs	Where they live	Example
				lion
		two		
			in water	
reptiles				
		four (adults)		

5. Think, pair, share! **Research an animal from your environment. Write and illustrate it. Add two sentences that describe it and share with a classmate.**

6. 9 QUIZ **Check your learning.**

Invertebrate groups



Read and think

1. **Read and find out:**
   - **a)** where invertebrates live.
   - **b)** what's special about molluscs.
   - **c)** what's special about arthropods.
   - **d)** what's special about worms.

Most animals on Earth are **invertebrates**. There are many different groups of invertebrates.

Some invertebrates, such as jellyfish, live in the water. Others, such as earthworms, live on land. Some, such as mosquitos, can fly. Here are three groups of invertebrates.

Worms

Worms have a **long**, **soft body**. Some live on land and others live in water. Some worms are parasites, for example, leeches and flatworms. They live inside, or on the skin of, another animal and feed on them.


A leech is a worm.


Flatworms live in water.


Earthworms live on land.

Molluscs

Molluscs have a **soft**, **muscular body**. Many molluscs live in the sea. Mussels and oysters are molluscs.


Snails are molluscs.


Octopuses are molluscs.


Oysters are molluscs.

Arthropods

The biggest group of invertebrates are the arthropods. Their body has three parts: **head**, **thorax** and **abdomen**. Many of them have **antennae** and some have **wings** too. **Insects** (beetles and bees) are arthropods. Spiders and scorpions are arthropods too. Some arthropods, such as insects, have six legs. Others, such as spiders, have eight legs. There are even arthropods with more than a hundred legs!

Beetles are arthropods.

Spiders are arthropods.

Centipedes are arthropods.

Activities

2. 10 **Say the *Invertebrates* chant.**

3. Think, pair, share! **Which is the odd one out? In your notebook, write why. Share with a classmate.**

a) ant	spider	octopus	bee
b) oyster	mussels	snail	butterfly
c) eathworm	flatworm	caterpillar	leech

4. Do! **Draw an arthropod and label these parts:**

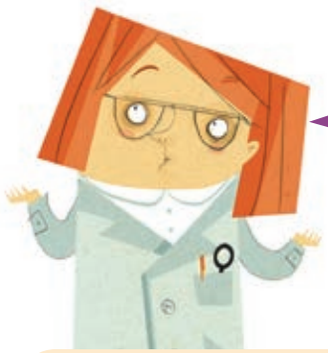
head thorax abdomen antennae legs wings

5. **Copy the words and write *soft body*, *muscular body* or *three parts*.**

a) beetle	**c)** oyster	**e)** bee
b) earthworm	**d)** leech	**f)** jellyfish

6. 11 QUIZ **Check your learning.**

Animal nutrition and reproduction



Do cats and ducks eat the same food? How are they born?

Read and think

1. **Read and find out:**

a) Are we carnivores? Are we viviparous?

b) Are most animals viviparous or oviparous?

Not all animals eat the same food. They can be **herbivores**, **carnivores** or **omnivores**.

Some animals only eat **plants**, for example, rabbits and pandas. They are **herbivores**.

Some animals only eat **other animals**, for example, lynxes and spiders. They are **carnivores**.

Some animals eat **plants** and **other animals**, for example, bears and mussels. They are **omnivores**.

Not all animals reproduce in the same way. They can be **viviparous**, **oviparous** or **ovoviviparous**.

All mammals **are born directly** from their mother. They are viviparous.

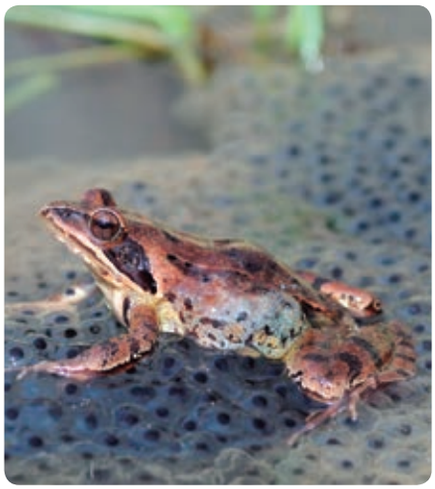
Kangaroos are viviparous.

Sheep and seals are born directly from their mother too.

All invertebrates are born from **eggs**. Some vertebrate groups are born from eggs too: fish, amphibians, reptiles and birds. They are **oviparous**. Some animals, such as birds, lay eggs with a **hard shell**. Other animals, such as fish, lay **soft eggs**.

Birds are oviparous.

Crocodiles lay hard eggs.



Frogs lay soft eggs.

Activities

2. 12 **Listen and repeat.** 13 **Now listen and put up one hand when the word is related to nutrition and two when it is related to reproduction.**

3. **In your notebook, write *herbivore*, *carnivore* or *omnivore* next to each animal.**

cow lion mussel sheep bear bee spider rabbit cat

4. Think **In your notebook, write *viviparous* or *oviparous* next to each animal. Where the animal lays eggs write *hard shell* or *soft shell*.**

salmon eagle donkey dolphin toad shark penguin duck zebra

5. Do! **Read the sentence and think of animals. Fill in the names. Then draw a picture.**

a) _____ are carnivores. They are oviparous. b) _____ are viviparous. They are herbivores.

6. 14 QUIZ **Check your learning.**

Experiment time!

The life cycle of a silkworm

ASK A QUESTION

What are the stages of the life cycle of a silkworm? How long is each stage?

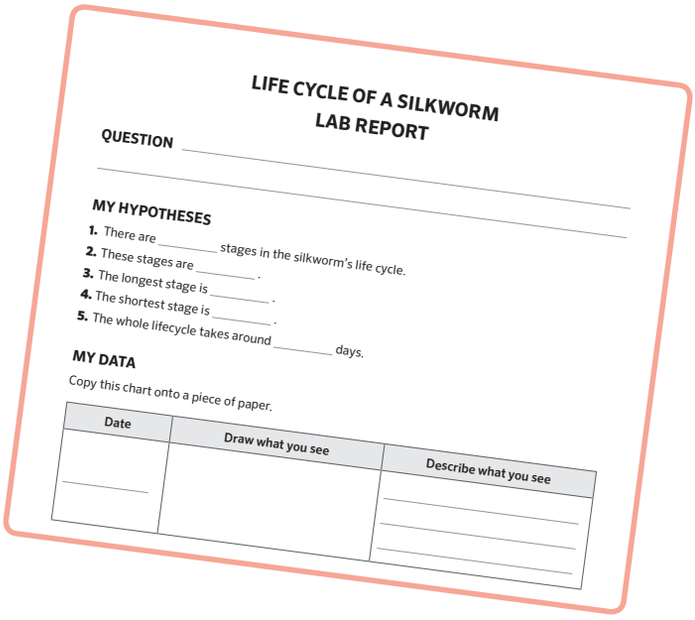
DO RESEARCH

- Find out if anyone you know has kept silkworms before and what happened.
- Look for information or a video on the Internet.

MAKE HYPOTHESES

Think, pair, share! Discuss these questions with a classmate. Then write your hypotheses on your lab report (template 1.1).

1. How many stages are there?
2. What are they?
3. Are all the stages the same length? Which ones are longer?
4. How long is the whole life cycle?



LIFE CYCLE OF A SILKWORM
LAB REPORT

QUESTION _____

MY HYPOTHESES

1. There are _____ stages in the silkworm's life cycle.
2. These stages are _____.
3. The longest stage is _____.
4. The shortest stage is _____.
5. The whole lifecycle takes around _____ days.

MY DATA

Copy this chart onto a piece of paper.

Date	Draw what you see	Describe what you see

TEST YOUR HYPOTHESES

MATERIALS

- template 1.1
- magnifying glass
- mulberry leaves
- ruler
- show box
- silkworm eggs

PROCEDURE

Observe what happens to the eggs. Record your data.

1. Put the leaves and eggs into the box. Write the date and record what you see in your lab report.

2. Every day look at the eggs through a magnifying glass. When there is a change write the date and record what you see on your lab report.

3. Remember that the silkworms are animals and be careful not to touch or disturb them.

4. Use a ruler and neat handwriting to keep your lab report clear.

ANALYSE YOUR DATA AND MAKE CONCLUSIONS

1. **Look at your data and calculate the number of days.**

2. Think, pair, share! **First check your hypotheses. Then write your conclusions on your lab report (template 1.1).**

EVALUATE YOUR EXPERIMENT

Think, pair, share! **How accurate was your experiment? Explain your answer on your lab report (template 1.1). How did you take care of your silkworms?**

DON'T FORGET TO WATCH THE VIDEO!

Let's revise!

1. QUIZ **Choose the correct answer.**

a) Animals that don't have a backbone are called...

1. vertebrates.
2. invertebrates.
3. insects.

b) There are ... groups of invertebrate animals.

1. three.
2. many.
3. two.

c) Animals that lay eggs are called...

1. viviparous.
2. oviparous.
3. mammals.

d) A mussel has a ... to protect its body.

1. exoskeleton.
2. shell.
3. thorax.

2. **In your notebook, correct the mistakes in these crazy sentences.**

a) A fish has tentacles.

b) Rabbits are oviparous.

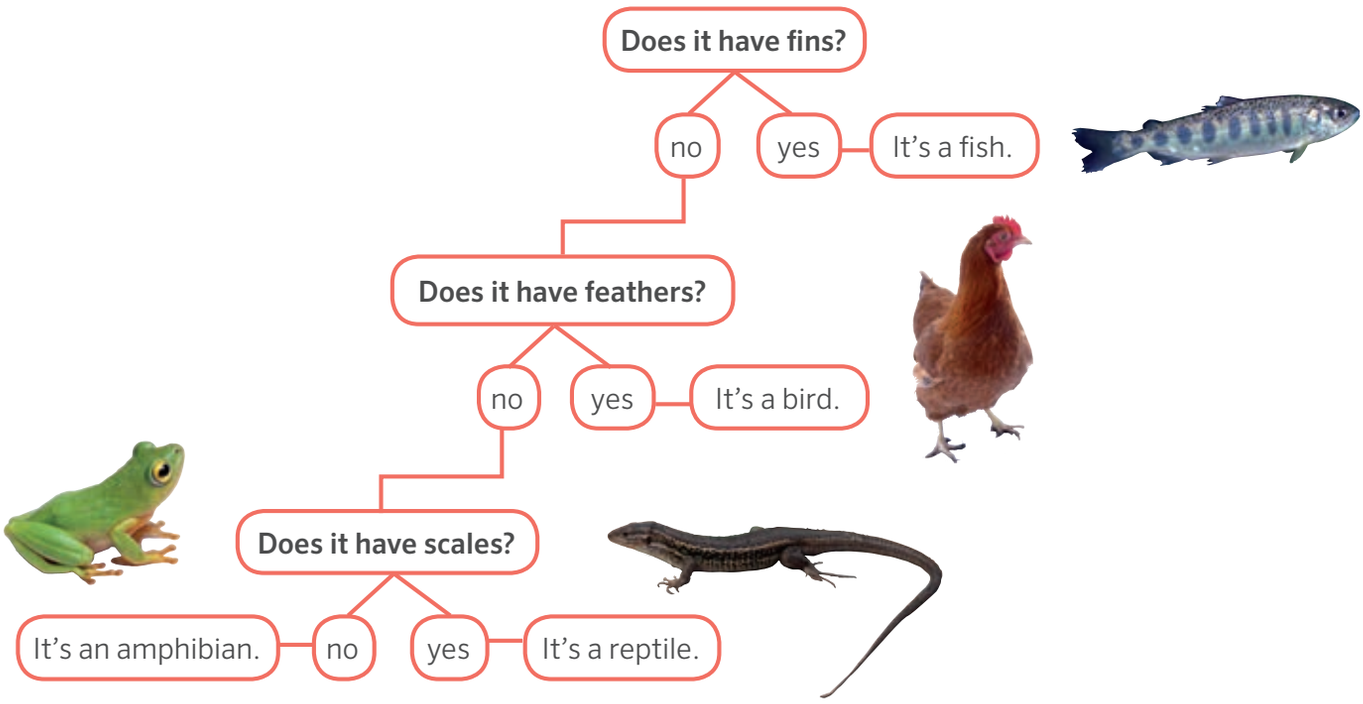
c) Frogs are viviparous.

d) Octopuses have a backbone.

e) All vertebrates have antennae.

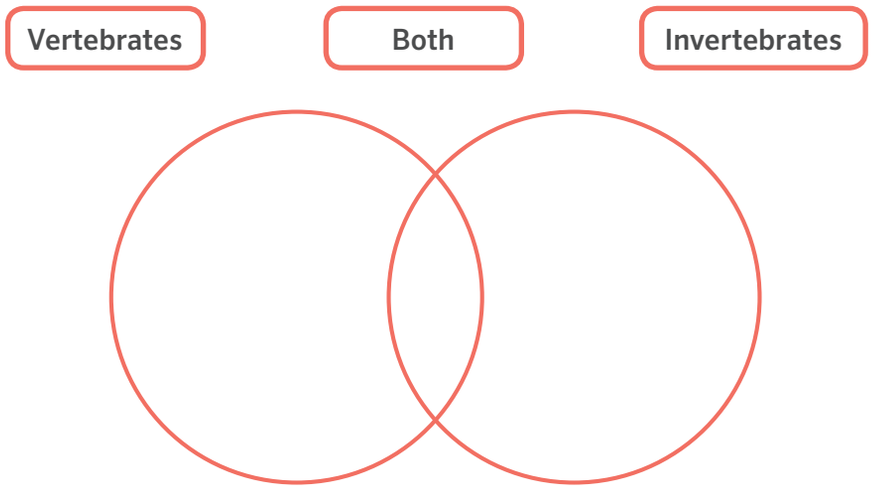
f) Caterpillars have an exoskeleton.

3. 15 **Listen and say the animal.**



4. Think . . . **Copy and complete the Venn diagram in your notebook.**

live in water	don't have a backbone	are carnivores
have tentacles	are oviparous	many have exoskeletons
have scales and fins	are omnivores	some are viviparous
can swim	have a shell	have feathers



5. **Which groups of vertebrates do these animals belong to?**

a) bat
b) frog
c) cat
d) cow
e) chicken
f) dove
g) tortoise
h) salmon
i) lizard
j) goat
k) shark
l) toad

My work in this unit is...

OK ★ good ★★ excellent

Ask a classmate.

Study skills!

1. **In your notebook, copy and complete the concept map using the words from the unit.**

worm birds reptiles oviparous fish herbivore molluscs carnivore

2. **Think, pair, share!** **Revise with a classmate using the concept map.**

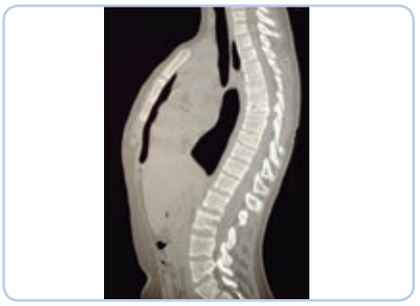
a) Compare your concept map with a classmate. What's the same? What's different?

b) Use your concept maps to ask each other questions. For example:

How many groups of vertebrates are there?
What are their names?
Give me an example of an amphibian / a mammal.
What does an omnivore eat?
What are the three types of reproduction?

PICTURE DICTIONARY

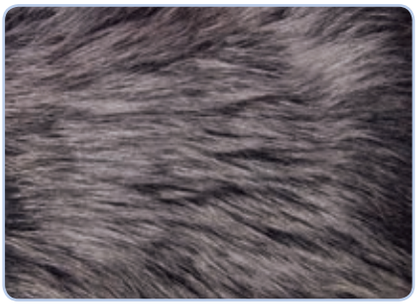
arthropods



backbone

exoskeleton

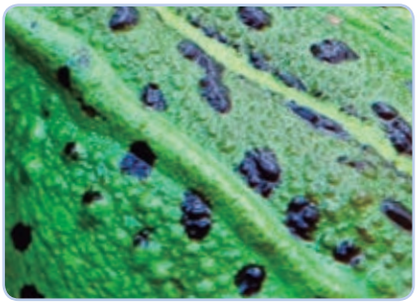
fins



fur

gills

invertebrates



moist skin

molluscs

scales

shell

vertebrates

Think about ANDALUSIA Project

Resources in nature

Discover Andalucía

There are lots of important and varied habitats and ecosystems in Andalucía, full of amazing animals and plants. Let's find out how humans interact with them and what they give us!

1. **Look at the photos and answer with a classmate. Then complete the sentence in your notebook.**

a) What can you see in the photo?
b) Describe the climate.
c) What type of trees are these?
d) What products can we obtain from them?
e) Can you name a dish from Andalucía which uses this product?

_____ comes from olive trees and we use it in many traditional dishes from Andalucía, such as _____.

2. **Draw and label the parts of an olive tree.**

3. **Identify the instruments for investigating ecosystems.**

magnifying glass

microscope

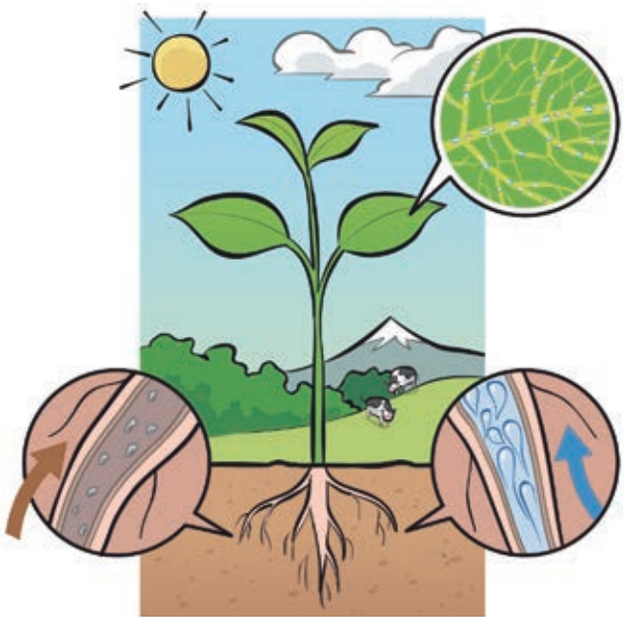
tape measure

4. **Copy and complete the sentences in your notebook.**

1. **When you brush your teeth...**
   a) turn off the tap. **b)** leave the tap on.
2. **If there's a water leak...**
   a) don't do anything about it. **b)** tell an adult.
3. **Have a shower...**
   a) instead of a bath. **b)** as well as a bath.

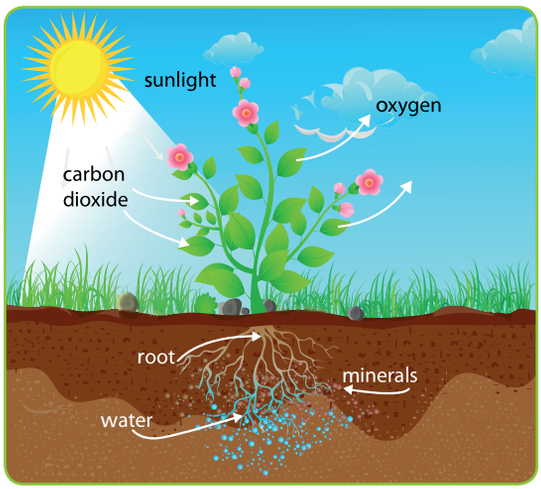
Think .. **Think of two more ways you could save water.**

Water is an essential element for ecosystems and to help plants carry out photosynthesis.



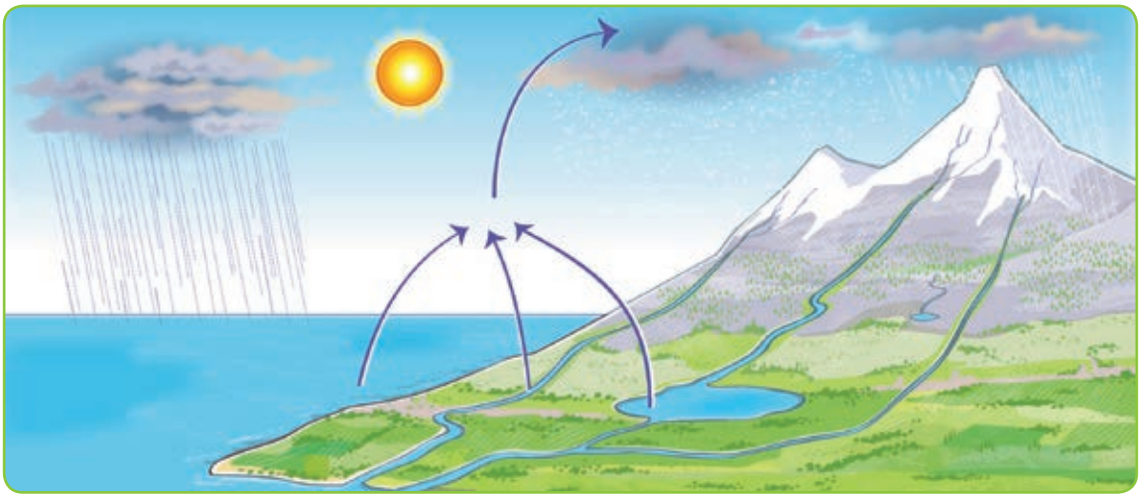
5. **Draw a plant in your notebook and label: *sunlight*, *water*, *oxygen*, *carbon dioxide*. Then use the words to complete the sentences.**

Plants make food through a process called photosynthesis.
Roots absorb minerals and _____ from the soil.
The leaf absorbs _____ from the air.
Finally, _____ is returned to the air.



Research

1. **Find out about the water cycle. Use books or the Internet.**



Look at the picture. Answer the questions in small groups.

a) Describe what is happening.
b) Which states of water can you see?
c) How many stages can you identify in this process?
d) Does this cycle help olive trees grow?

2. **Say if these sentences are *true* or *false*. Correct the false sentences in your notebook.**

a) The water cycle is a continuous process of evaporation, condensation, precipitation and collection.	T
b) Emancipation is when water drops fall as rain or snow.	
c) When water turns into water vapour it's called collection.	
d) Condensation is when water vapour cools and forms clouds.	

Create **Draw and label the water cycle in your notebook.**

3. **With a classmate, copy and complete the table using the words. Then write two sentences.**

wasps grass flies nettles grasshoppers ants

Some plants we find in an olive grove ecosystem are...	Some animals we find in an olive grove ecosystem are...

4. **Read the sentences and write *protect*, *cut* or *harvest* in your notebook.**

Some activities humans do in this ecosystem are...

_____ the branches to help them grow well.

_____ the trees from flies, by setting insect traps.

_____ the olive fruits when they are ready.

What activity can you see in the photo?

5. Think, pair, share! **Use the Internet to find out more about olive trees. Answer the questions with a classmate.**

- How long can an olive tree live?
- How tall can it be?
- Does it need a lot of water to grow?

6. **Read the clues and guess with a classmate.**

a) This instrument is long and flexible. It measures length.
b) This instrument is a lens that makes an object appear larger. It's easy to carry around.
c) This instrument make very small things appear larger so that you can examine them carefully.

7. **Think of another instrument for investigating ecosystems. Draw it and write about what it does.**

Collaborate

Make a local ecosystem poster.

RESEARCH

1. In groups, choose an ecosystem in Andalusia. Look for information on the Internet and in books.

Wetlands of Doñana

Tabernas Desert

2. Find out about animals, plants and non-living things in your ecosystem.

Some plants in this ecosystem are...	Some animals in this ecosystem are...	Some non-living things in this ecosystem are...

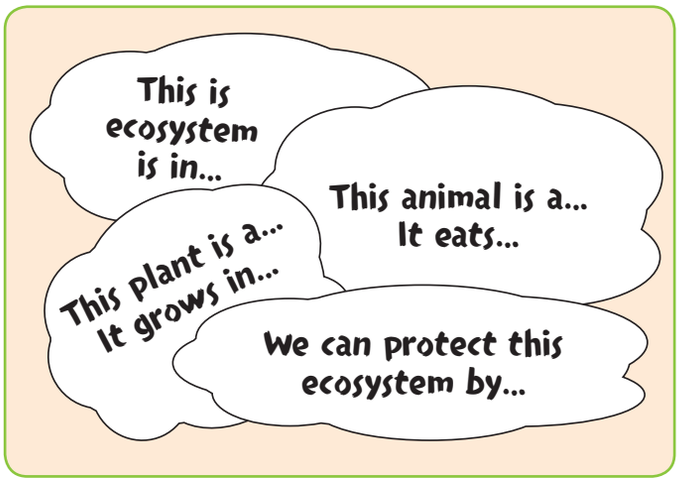
Where is the water in your ecosystem?

3. What natural resources does this ecosystem have?

MATERIALS

- card
- coloured pencils
- glue
- pictures from the Internet
- scissors
- small labels with names and information

CREATE



1. Prepare small labels for the plants, animals and the information.

2. Decide who's going to make each part of the ecosystem. Cut out the pictures.

3. Prepare your plants, animals and non-living things for the ecosystem.

4. Stick all your pictures and labels. Write the name of the ecosystem in big letters.

SHARE

- Collaborate **Present your poster to your classmates. Say why your ecosystem is important. How can we protect it?**
- **Display your posters in a corridor of your school. Invite other classes to visit your display.**