In this unit you will learn about...

- the Animal, Plant and Fungi kingdoms.
- invertebrate groups.
- vertebrate animals: respiration, nutrition and reproduction.
- plant nutrition and respiration.
- plant reproduction.

Living and non-living things are everywhere.

All living things are born, grow and die.

Find out how potatoes reproduce!
1. **Listen and say which photo.**

2. **Think ** Read and answer the questions in your notebook.
   
   a) What’s the difference between living and non-living things?
   
   b) What are the three life processes of living things?
   
   c) Why is nutrition important for living things?
   
   d) What’s interaction?
   
   e) What’s reproduction?

3. **Do!** In your notebook, circle the animal words in orange and the plant words in green.

   backbone leaves roots torso tail wings fur stem legs petals fins stamen pistil shell scales
In order to study living things, we divide them into groups called **kingdoms**.

Living things in the different kingdoms carry out the three life processes of **nutrition**, **interaction** and **reproduction** in different ways.

**The Animal Kingdom**

Animals **can move around**. They **eat other living things**. Vertebrates and invertebrates are different types of animals.

**The Plant Kingdom**

Plants **can't move around**. They **make their own food**. Grasses, bushes and trees are different types of plants.

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**Read and think**

1. **Read and find out.**
   a) How are plants similar to fungi?
   b) In what ways is nutrition different in the three kingdoms?
The Fungi Kingdom

Like plants, fungi can’t move around. However, they don’t make their own food. Fungi eat the remains of dead living things or grow and feed on things that are still living. Mushrooms, mould and yeast are all fungi. We use yeast to make bread and we can eat some types of mushrooms, but some are poisonous.

Activities

2. Listen and repeat. Now listen and say Plant Kingdom, Animal Kingdom or Fungi Kingdom.

3. Copy and complete the table in your notebook.

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Nutrition</th>
<th>Can interact with the environment by moving around</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>They eat other living things.</td>
<td></td>
</tr>
<tr>
<td>Mould</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mushrooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree fungus</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. In your notebook, answer the questions.
   a) Which kingdom do snails, octopuses and leopards all belong to?
   b) Why is it an advantage that animals can move around?
   c) What happens if you keep fruit too long after you buy it?
   d) Plants are called ‘producers’. Why do you think this is?

5. Check your learning.
97% of all animals are invertebrates. The most common groups are molluscs, jellyfish, sponges, echinoderms, annelids and arthropods.

Invertebrates live almost everywhere. Scientists are still finding new species.

Most invertebrates are small. Some are so small that they can only be seen with a microscope. A few invertebrates are very big, such as the colossal squid, that can be bigger than an elephant and has the biggest eyes in the Animal Kingdom.

### Molluscs
They have a soft muscular body, often protected by a hard shell. Some, such as snails, live on land. But most, such as mussels and octopuses, live in the sea.

### Jellyfish
They live in the sea. They have a soft body called the umbrella and often have long tentacles. There’s a hole under their umbrella that is both a mouth and an anus.

### Sponges
They live in the sea. They have soft bodies covered with small holes. They stay on the seabed and take in oxygen and food through the holes. There are lots of known species of sponges.

### Echinoderms
They live in the sea. They’re protected from predators by hard skin or spines and are often brightly coloured. Starfish are echinoderms. They usually have five arms but can have up to 40!

### Annelids
Some of them live in the sea. They have a long, soft body divided into segments. A very important annelid is the earthworm. Earthworms help to get air and nutrients into the soil. Can you say how?
Invertebrates

Almost all animals on Earth are arthropods. They live in water, on land, in the air and underground. They have a **head**, a **thorax** and an **abdomen**, **jointed legs** and a hard protective **exoskeleton**. The biggest group of arthropods is **insects**. The other main groups are **arachnids**, **crustaceans** and **myriapods**.

Do you know how you can tell a spider is not an insect? Count the legs! An insect has six legs and an arachnid has eight.

**Activities**

2. Listen and repeat. Now listen and say the invertebrate group each word is related to.

3. In your notebook, match to make sentences.

   a) They have spines...
   b) They have shells...
   c) They have small holes...
   d) They have tentacles...

   1. to take in oxygen and food.
   2. to keep away predators.
   3. to capture animals to eat.
   4. to stop other animals eating them.

4. Make a mind map of the invertebrate groups including examples of animals, where they live (land, air, water) and their main characteristics.

5. Check your learning.

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**Arthropods**

- Bees are **insects**.
- Scorpions are **arachnids**.
- Crabs are **crustaceans**.
- Millipedes are **myriapods**.
What am I?

BEFORE YOU READ

1. Think, pair, share! Look at the pictures. In each case, how is Annie similar or different to the other animal?

Annie sits on a green leaf. She’s not happy!

1. Oh, what am I? I know I’m not a sponge because I haven’t got lots of small holes, but what am I?

She meets an ant.

2. Am I an arthropod?

No! Sorry! You haven’t got three parts or jointed legs or even an exoskeleton!

She meets a snail.

3. Am I a mollusc?

No! Sorry! You haven’t got a shell and you aren’t muscular like me!

She goes down to the sea. She meets a starfish.

4. Am I an echinoderm?

No! Sorry! You haven’t got hard skin and you don’t live in the sea!
2. Complete the sentences in your notebook.

a) ____________ and ____________ both live in the sea, but only ____________ have tentacles.

b) Ants have an ____________ and they belong to the invertebrate group called ____________.

c) Annie is an earthworm. Earthworms are ____________ that live in the soil.

3. **Create** Choose an animal from a different invertebrate group and act out a similar story.

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Then she meets a jellyfish.

And you’re not a jellyfish! You haven’t got lovely tentacles like me. Ha ha!

Suddenly she hears some little voices.

You’re an annelid like us!

Come and play and make tunnels in the soil like us!

Well, I’m not an arthropod, I’m not a mollusc, I’m not an echinoderm and I’m not a jellyfish. Oh dear! What AM I?

And now Annie knows what she is!

Now I know! I’m an annelid! I’m Annie the Annelid! Hooray!

You’re an annelid like us!

Ha ha!
Vertebrates

Read and think

1. Read and find out:
   a) How are reptiles and fish similar?
   b) In what ways are mammals different to other vertebrates?

All vertebrates have a **backbone**, but how they **breathe**, how they **reproduce**, and what they **eat** can be different, even within a group.

**Respiration**

All animals need oxygen to live. Mammals, reptiles and birds breathe with **lungs**. They use lungs to take oxygen from the air. Fish use **gills** to take oxygen from the water. Water enters the mouth and goes through the gills so they can get oxygen. Amphibians have gills when they are young and live in water, and later develop lungs to live on land.

**Reproduction**

All **mammals** are **born directly** from their mother. They are **viviparous**. Mammals also **produce milk** to feed their babies and look after them for a long time. All other groups reproduce by laying **eggs**. They are **oviparous**. Some eggs have a **hard shell**, such as chicken eggs and some are **soft**, such as frog and fish eggs.
Nutrition

Most vertebrates are **omnivores** (they eat plants and other animals) or **carnivores** (they only eat other animals). Some mammals and fish and a few birds are **herbivores** (they only eat plants), but almost all reptiles and amphibians are carnivores.

Lions are carnivores.

Giraffes are herbivores.

Hedgehogs are omnivores.

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**Activities**

2. 🎶 **Say the Vertebrates chant.**

3. In your notebook, copy and complete the table.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Group</th>
<th>Respiration</th>
<th>Reproduction</th>
<th>Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>sheep</td>
<td></td>
<td>lungs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>crocodile</td>
<td></td>
<td></td>
<td>oviparous</td>
<td></td>
</tr>
<tr>
<td>amphibian</td>
<td></td>
<td>gills</td>
<td></td>
<td>omnivore</td>
</tr>
</tbody>
</table>

4. 🤔 **Choose the odd one out. In your notebook, write why.**

   a) tiger, spider, eagle, bee
   b) fish, frog, bear, lizard
   c) cow, tiger, butterfly, whale
   d) pig, sheep, human, bear
   e) dolphin, snake, crocodile, fish
   f) eagle, squirrel, hen, duck

5. 🎨 **Draw and label a fish’s head with the gills to show how water goes through them so they can get oxygen.**

6. 🎥 **Check your learning.**
Plant nutrition and respiration

Photosynthesis

Plants make their own food, called glucose, through a process called photosynthesis.

Photosynthesis takes place mainly in the leaves. Water is absorbed from the soil by the roots and goes up the stem to the leaves. Leaves contain a green chemical called chlorophyll. This absorbs energy from sunlight. Leaves absorb carbon dioxide from the air. During photosynthesis, plants release oxygen into the air. Plants also need minerals for nutrition. Minerals are absorbed in the water by the roots.

Respiration

Respiration gives the plant the energy it needs to grow and be healthy.

Plants use the glucose made through photosynthesis and oxygen for respiration. During respiration, carbon dioxide and water is released into the air.

An interesting thing about plants is how photosynthesis and respiration work together. During photosynthesis, plants produce oxygen and glucose. These are needed for respiration. During respiration, plants release carbon dioxide and water. These are needed for photosynthesis.
The importance of photosynthesis

All animals, including humans, need oxygen to live. Plants give our planet oxygen through photosynthesis. That is why trees and other plants are so important and we should look after them and not cut them down.

Thank you, plants!

Activities

2. ♫ Sing the Photosynthesis song.

3. Copy and complete the sentences in your notebook.
   a) Plants use ______ and ______ and ______ to make ______.
   b) Leaves are green because of a chemical called ______. This absorbs ______.
   c) During photosynthesis, leaves absorb ______ and they release ______.
   d) During respiration, leaves absorb ______ and they release ______.

4. Do! Observe the oxygen!

   1. Put a leaf in water in a sunny place. Check after an hour.
   2. What are the little bubbles on the leaf (especially on the underside) and on the sides of the glass?
   3. Now put one leaf in water in a sunny place and one leaf in water in a dark place. Is there any difference?

5. Quiz Check your learning.
**Plant reproduction**

**Why do plants need bees?**

We can classify plants into **flowering plants** and **non-flowering plants**. Flowering plants develop **flowers** that have **sexual organs** (the stamen and the pistil) to help them reproduce. Non-flowering plants don’t use flowers for reproduction.

### Sexual reproduction

Most flowering plants reproduce by **sexual reproduction**. **Pollen** goes from the **stamen** of one flower to the **pistil** of a different, or the same flower. This is called **pollination**. This happens in different ways.

#### Insect pollination

![Insect pollination](image)

The pollen joins an **ovule** to make a **seed**. This is called **fertilisation**. The pistil grows around the seed into a **fruit**. The seed is dispersed in different ways: by **gravity** (it falls to the ground in the fruit), by **wind**, or by **animals**. The seed then grows into a plant.

### Asexual reproduction

In **asexual reproduction** there are **no flowers or fertilisation**.

- **Runners** are stems which grow along the ground. **Buds** grow from the stems and develop into new plants.
- **Tubers** are swollen stems which grow under the ground. **Buds** grow from the tubers and develop into new plants.
- Some flowering plants, such as the strawberry, use sexual AND asexual reproduction!
Looking after living things

We should respect and protect living things and their habitats. Look at the photos.
Which of these things should we do? Which shouldn’t we do?

Activities


3. In your notebook, copy the true sentences and correct the false ones.
   a) In sexual reproduction, pollen is produced by the pistil and carried to the stamen.
   b) Pollination is helped by animals, especially insects, and by the wind.
   c) In asexual reproduction, the plant doesn’t have reproductive organs.
   d) No plants use both sexual and asexual reproduction

4. Think Match and write We should or We shouldn’t.
   a) [ ] collect dogs on a lead.
   b) [ ] pick butterflies.
   c) [ ] keep wild flowers.

5. Quiz Check your learning.

Drop rubbish. Touch wild animals. Climb trees. Stay on the path.

Make a fire in the forest. Feed birds in the winter. Remove animals from their habitats. Touch bird’s nests.
Experiment time!

An example of asexual reproduction

**DO RESEARCH**
- Find out how potatoes reproduce.
- Ask family and friends.
- Read page 16 in this book.
- Look for pictures.
- Watch a video

**MAKE HYPOTHESES**

**Think, pair, share!** Complete and discuss these hypotheses with a classmate. Then write your hypotheses in your lab report (template 1.1).

1. The [_____] on the potato grow [______], and a [_____] and [______].
2. The potato makes more [______] under the ground.
3. The [______] under the ground grow [______], a [_____] and [______] and make new plants.

**TEST YOUR HYPOTHESES**

**MATERIALS**
- template 1.1
- 2 potatoes
- plastic cup
- large plant pot
- toothpicks
- potting soil
- water

**ASK A QUESTION**

How do potatoes reproduce?
PROCEDURE

1. Write your name on a plastic cup and stick the toothpicks in a circle around the middle of a potato.

2. Pour some water into the plastic cup. Put in your potato. Make sure the water is touching the bottom of the potato. Observe the potato every week and record your data in your lab report.

3. Write your name on the plant pot. Add soil and put in a potato. Put the plant pot in a bright place. Make sure the soil stays moist.

4. Gently dig the soil each week to observe what’s happening to the potato. Record your data in your lab report.

ANALYSE YOUR DATA AND MAKE CONCLUSIONS

1. Look at your data and complete the sentences in My analysis on your lab report.

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

EVALUATE YOUR EXPERIMENT

**Think, pair, share!** How can you improve the experiment for next time? Discuss with a classmate.

DON’T FORGET TO WATCH THE VIDEO!
Let's revise!

1. In your notebook, circle the animal words in **orange** and the plant words in **green**.

   - tentacles
   - shell
   - runners
   - arthropods
   - tuber
   - gills
   - pollination
   - viviparous
   - exoskeleton
   - photosynthesis
   - chlorophyll
   - carnivore
   - pistil
   - molluscs
   - bud

2. **Think**  Which is the odd one out? Write why.
   
   a) herbivore  viviparous  carnivore  omnivore
   b) carbon dioxide  oxygen  water  pollen
   c) arthropod  annelid  amphibian  mollusc
   d) stamen  ovule  tuber  pistil

   Now write some yourself and test your partner.

3. **Listen** and say the name of the living things.

![Images of various living things: tentacles, shell, runners, arthropods, tuber, gills, pollination, viviparous, exoskeleton, photosynthesis, chlorophyll, carnivore, pistil, molluscs, bud.]

4. **Think**  Answer the questions with a partner.
   
   a) Fill in the missing words:
   
   photosynthesis = water +  +  =  +
   
   b) Write what plants need for respiration.

   c) Write the functions of the following parts of a plant in nutrition: the roots, the stem and the leaves.
5. **Correct the crazy sentences.**
   
a) All plants use asexual reproduction.

b) In self-pollination, the pollen goes from the pistil of a flower to the stamen of the same flower.

c) The stamen grows around the seed into an ovule.

d) Runners are roots that grow along the ground.

6. **Choose words to write correct sentences in your notebook. There are some extra words!**

   soft  exoskeleton  viviparous  three  hard  spines  carnivores  
   oxygen  herbivores  six  oviparous

1. There are  common groups of invertebrates.

2. Some molluscs have a  shell for protection.

3. Arthropods have  main body parts.

4. Every animal needs  to live.

5. Annelids have  bodies divided into segments.

6. All mammals are  .

7. Almost all amphibians are  .

7. **Think.** Write your own sentences with the extra words from activity 4.

   
   My work in this unit is...

   ![Rating Stars: OK, good, excellent]
   
   Ask a classmate.
**Study skills!**

1. **Copy and complete the concept map in your notebook. Use the word bank.**

   - pollination  
   - photosynthesis  
   - gills  
   - tubers  
   - small holes  
   - tentacles  
   - viviparous  
   - insect pollination  
   - carnivore  
   - yeast  
   - lungs  
   - molluscs

   ![Concept Map]

2. **Collaborate** Revise with a classmate using the concept map.

   a) Compare your concept map with a classmate. Are they the same?

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

   - How many invertebrate groups can you remember?
   - Can you draw a diagram for self-pollination?
   - What do plants need for photosynthesis?
   - Where do fish get their oxygen and how?
bud: small growth on a plant can grow into a new plant, for example a potato bud.

mould: type of soft fungus that grows on old food or wet objects.

exoskeleton: hard external covering for the body of many invertebrates.

fertilisation: process in plant reproduction when the pollen joins an ovule in a plant.

pollination: process by which pollen goes from the stamen of a flower to the pistil of a different or the same flower.

photosynthesis: process by which plants use sunlight to convert carbon dioxide and water into glucose.

runner: long stem of a plant that grows along the ground to form new plants.

self-pollination: transfer of pollen from a flower to the pistil of the same flower.

tuber: swollen stem that grows under the ground to form a new plant.

yeast: A type of fungus. There are many types of yeast. Some are used to make bread.

insect-pollination: process of pollination when pollen is transferred from one flower to another by insects.

kingdoms: main groups that all living things are classified into, for example, the Animal Kingdom.

lungs: bag-like organs for breathing in mammals, reptiles and birds.