

# Living things

## Objectives

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.



**Experiment time!**

Find out how potatoes reproduce!

3



All living things carry out three life processes: nutrition, interaction and reproduction.

5



Living things react to their environment to survive. This is called interaction.

4



Living things need nutrients from food to survive. This is called nutrition.

6



Living things reproduce to make more living things of the same type.

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

# Kingdoms



How are animals and plants different?

## 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?

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.

### Vertebrates



### Invertebrates



## The Plant Kingdom

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

### Grasses



### Bushes



### Trees



## 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.

### Mushrooms



### Tree fungus



### Yeast



### Mould





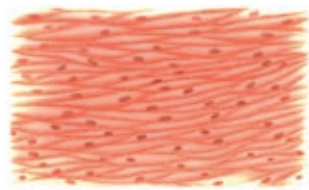
## The organization of living things

All living things are formed from cells. **Cells** form **tissues** that make up **organs**. Groups of organs form **systems**.

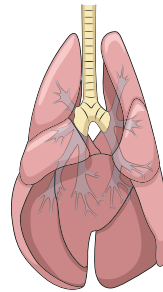
A **cell** is the smallest living unit.



Cells work together to form **tissue**, such as **muscle tissue**. Each type of tissue has a specific function.



Tissues work together to form **organs**, such as **lungs**.



Groups of organs form **systems** that perform specific functions, such as the **circulatory system**.



### 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.

Kingdom	Nutrition	Can interact with the environment by moving around
	They eat other living things.	
Plant		
		They can't move around.

4. **Think** In your notebook, answer the questions.

- Which kingdom do snails, octopuses and leopards all belong to?
- Why is it an advantage that animals can move around?
- What happens if you keep fruit too long after you buy it?
- Plants are called 'producers'. Why do you think this is?

5. **QUIZ** Check your learning.

# Invertebrates



What do invertebrates have instead of a backbone?

## Read and think

### 1. Read and find out.

- a) Which groups have a hard protective part?
- b) Which groups live only in water?
- c) Which is the biggest group?

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?

## Arthropods

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 **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.



Bees are **insects**.



Scorpions are **arachnids**.



Crabs are **crustaceans**.



Millipedes are **myriapods**.

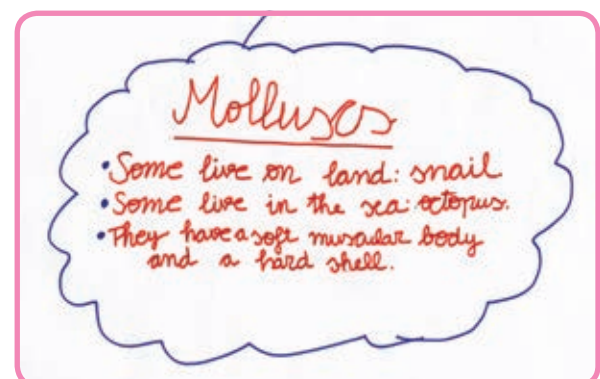
## Activities

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

3. **Think** In your notebook, match to make sentences.

- |                             |                                       |
|-----------------------------|---------------------------------------|
| a) They have spines...      | 1. to take in oxygen and food.        |
| b) They have shells...      | 2. to keep away predators.            |
| c) They have small holes... | 3. to capture animals to eat.         |
| d) They have tentacles...   | 4. to stop other animals eating them. |

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



5. **QUIZ** Check your learning.



# Vertebrates



How do  
vertebrates that  
live in water  
breathe?

## Read and think

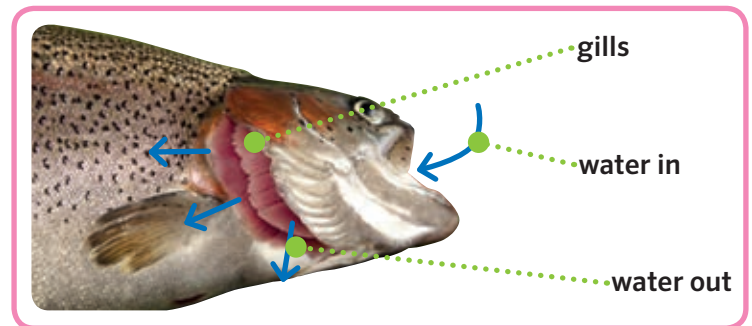
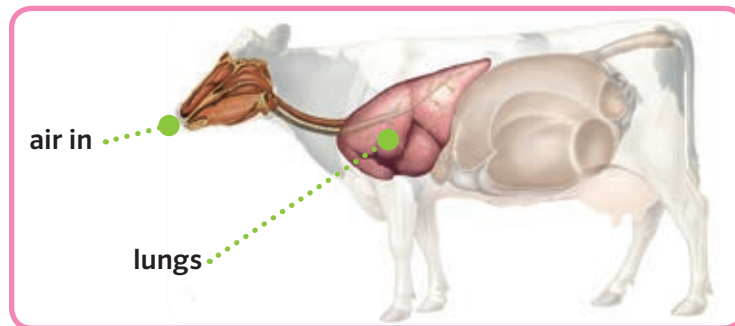
### 1. Read and find out:

- 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.



Elephants are viviparous.



Cows feed their babies milk.



Birds are born from 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.

## Activities

2. Say the *Vertebrates* chant.
3. In your notebook, copy and complete the table.

Animal	Group	Respiration	Reproduction	Nutrition
sheep	<input type="text"/>	lungs	<input type="text"/>	<input type="text"/>
crocodile	<input type="text"/>	<input type="text"/>	oviparous	<input type="text"/>
<input type="text"/>	amphibian	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	gills	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	omnivore

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

a) tiger, spider, eagle, bee

d) pig, sheep, human, bear

b) fish, frog, bear, lizard

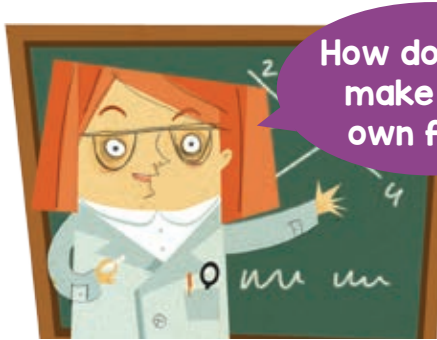
e) dolphin, snake, crocodile, fish

c) cow, tiger, butterfly, whale

f) eagle, squirrel, hen, duck
5. **Create** Draw and label a fish's head with the gills to show how water goes through them so they can get oxygen.
6. **QUIZ** Check your learning.



# Plant nutrition and respiration



How do plants make their own food?

## Read and think

### 1. Read and find out:

- a) What do plants need to make their own food?
- b) What do plants need for respiration?

## Photosynthesis

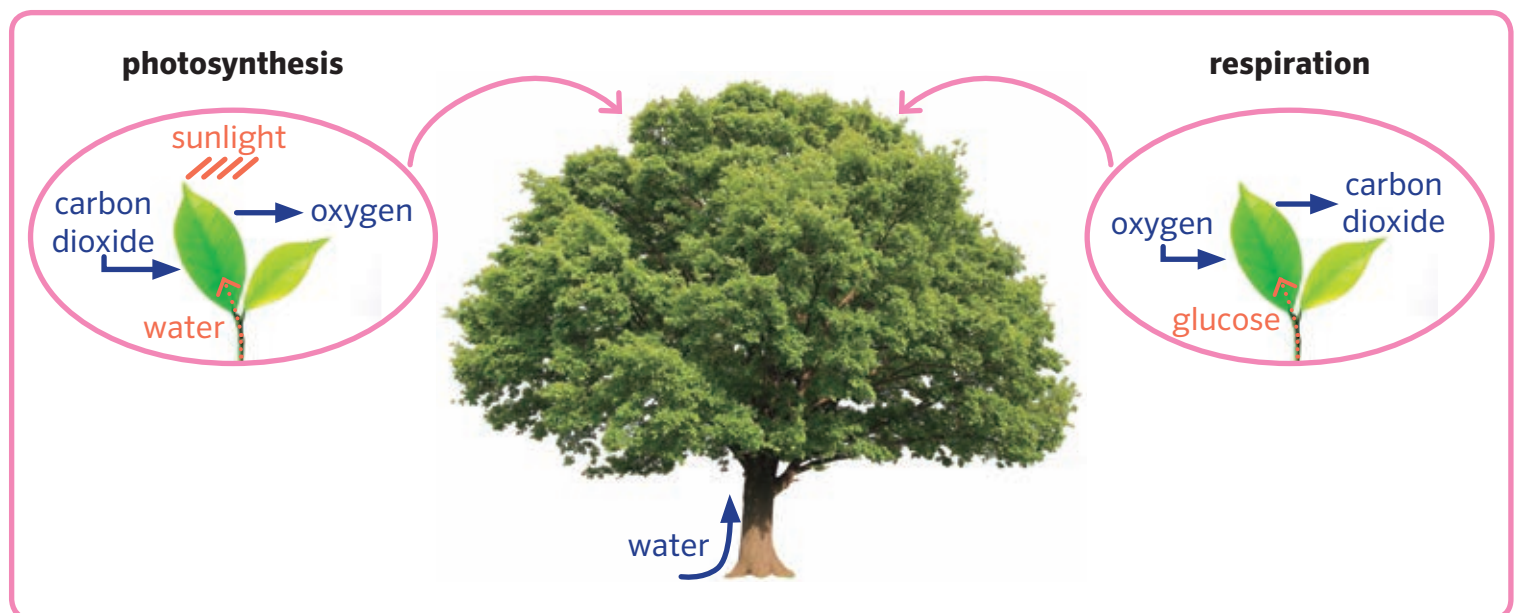
Plants make their own **food**, called **glucose**, through a process called **photosynthesis**.

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.



### 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.  **Observe the oxygen!**



You need:  
- a bowl  
- water  
- leaves

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.   Check your learning.

# Plant reproduction



Why do plants need bees?

## Read and think

### 1. Read and find out.

- a) What's the difference between sexual and asexual reproduction?
- b) How do animals help plants to reproduce?

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



Here I go!

### wind pollination



Here I go!

### self-pollination



Here I go!

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?



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.

## Activities

2.   **Listen and repeat.**  **Listen and put your hands on your head for sexual reproduction. Touch your nose for asexual reproduction.**
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.  **Do!** **Use a magnifying glass to look at flowers growing around your school. Take photos. Use the Internet to look at images of sexual reproduction in flowering plants and identify the stamen and pistil in your flowers. Draw and label diagrams.**
5.   **Check your learning.**

# 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

### ASK A QUESTION



How do potatoes reproduce?

### 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

#### AN EXAMPLE OF ASEYUAL REPRODUCTION LAB REPORT

WEEK	Inform

#### MY ANALYSIS

After \_\_\_\_\_ weeks t

After \_\_\_\_\_ weeks t

#### MY CONCLUSIONS

#### MY EVALUATION

#### AN EXAMPLE OF ASEYUAL REPRODUCTION LAB REPORT

##### QUESTION

##### MY RESEARCH

Circle everything you used.  
other people the Internet book(s) video(s) image(s) other \_\_\_\_\_

##### MY HYPOTHESES

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

##### MY DATA

WEEK	PLASTIC CUP		PLANT POT	
	Information	Drawing	Information	Drawing

## 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!**



# Ecosystems



Why do living things need each other?

## Read and think

### 1. Read and answer the questions.

- a) What's the difference between an ecosystem and a habitat?
- b) What's a population of living things?
- c) Why is a decomposer important in a food chain?

An **ecosystem** is the combination of a **habitat** and its **community** of living things.

An **ecosystem** includes all the living and non-living things in an area and the **interaction** between them. An ecosystem can be as small as a puddle or a pond, or as big as a woodland or enormous like a desert or tropical rainforest.



desert ecosystem



pond ecosystem

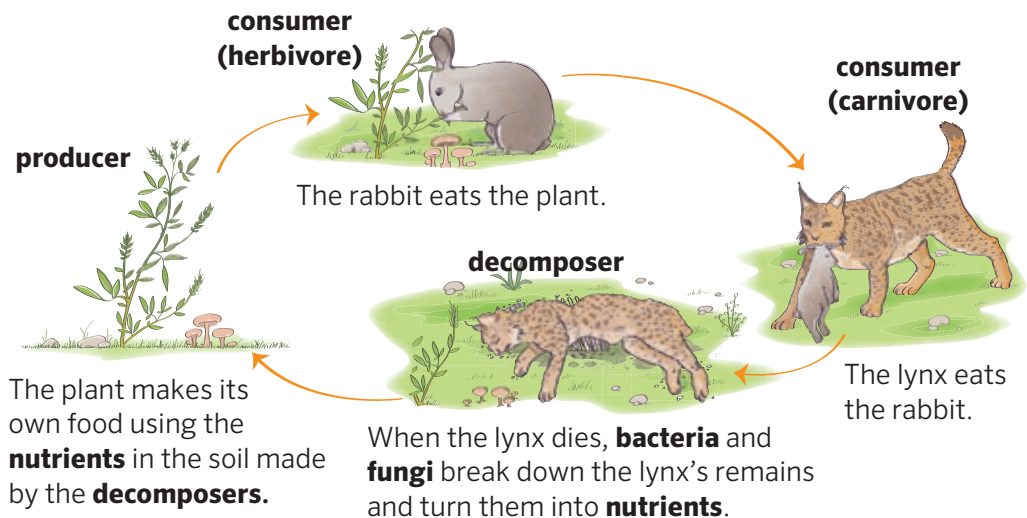


rainforest ecosystem

Living things of the **same species** which live in the same place are called a **population**. For example, in a temperate forest you can find a snail population, a fox population and an oak tree population. All the different populations that live in the same place are a **community**. The place they naturally live is called a

**habitat**. A habitat is defined by the amount of light and water, the temperature and the type of soil.





Each **ecosystem** is a delicate **balance** between the habitat and its community of living things. Every ecosystem has many **food chains**, in which living things depend on each other for **nutrition**. Here is an example of a food chain.







Look at this woodland ecosystem. How many different food chains can you see?



## Activities

2.   Listen and sing *The ecosystem song*.
3.  **Create** Look at the food chain. What kind of ecosystem does it come from? With a classmate, think of another food chain from the same ecosystem. Draw and label it in your notebook.
4.  **Think** How can we protect ecosystems? Match and write *We should* or *We shouldn't*.
 

a)  collect	dogs on a lead.
b)  pick	butterflies.
c)  keep	wild flowers.
5.  **Think** Circle the animals you find in a temperate forest. Write the ecosystem you think the other animals are from (*tropical rainforest, desert or ocean*).

crocodile   jellyfish   camel   fly   sponge   ant   starfish   butterfly  
spider   lizard   monkey   scorpion   ladybird   parrot   octopus   jaguar

I think/know the ... lives in a/an ... ecosystem.

6.   **Check your learning.**

## Let's revise!

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

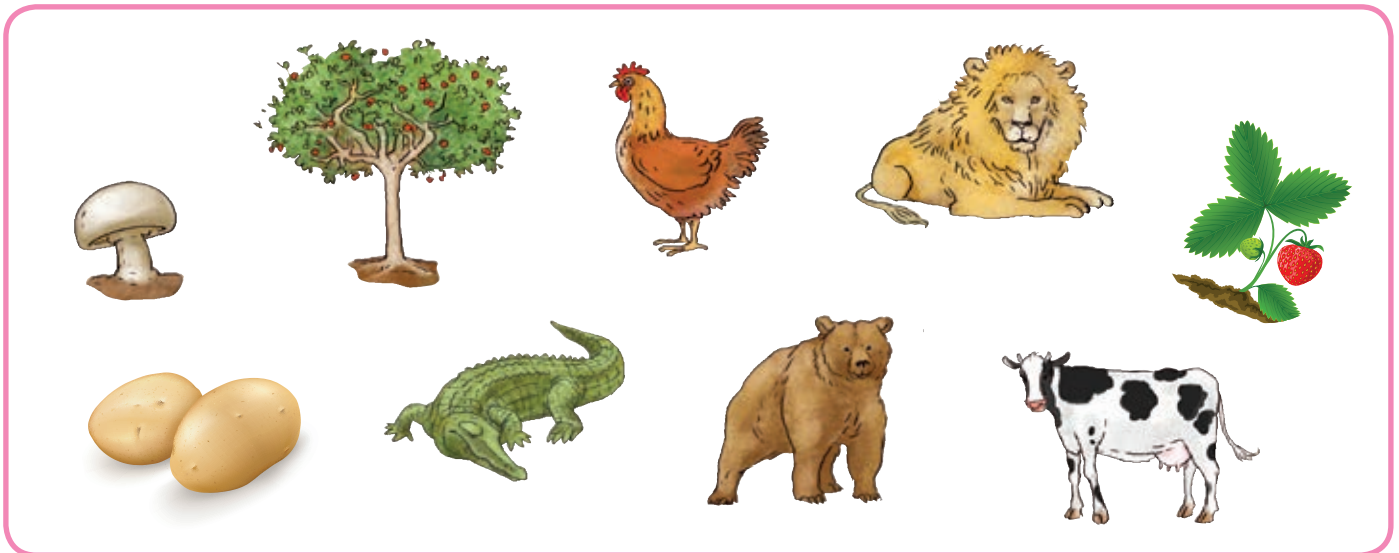
tentacles shell runners arthropods tuber gills pollination viviparous  
exoskeleton photosynthesis chlorophyll carnivore pistil molluscs bud

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



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. Complete the sentences with *systems*, *tissues*, *cells* and *organs*.**

\_\_\_\_\_ form \_\_\_\_\_ that make up \_\_\_\_\_. Organs form \_\_\_\_\_.

**7. Choose words to write correct sentences in your notebook. Write sentences with the extra words.**

soft    exoskeleton    viviparous    three    hard    spines    carnivores  
ecosystem    herbivores    producers    oviparous

- 1. Some molluscs have a \_\_\_\_\_ shell for protection.
- 2. Arthropods have \_\_\_\_\_ main body parts.
- 3. Annelids have \_\_\_\_\_ bodies divided into segments.
- 4. All mammals are \_\_\_\_\_.
- 5. Almost all amphibians are \_\_\_\_\_.
- 6. Plants are \_\_\_\_\_.
- 7. An \_\_\_\_\_ is the combination of a habitat and its community of living things.

**My work in this unit is...**

★ OK

★★ good

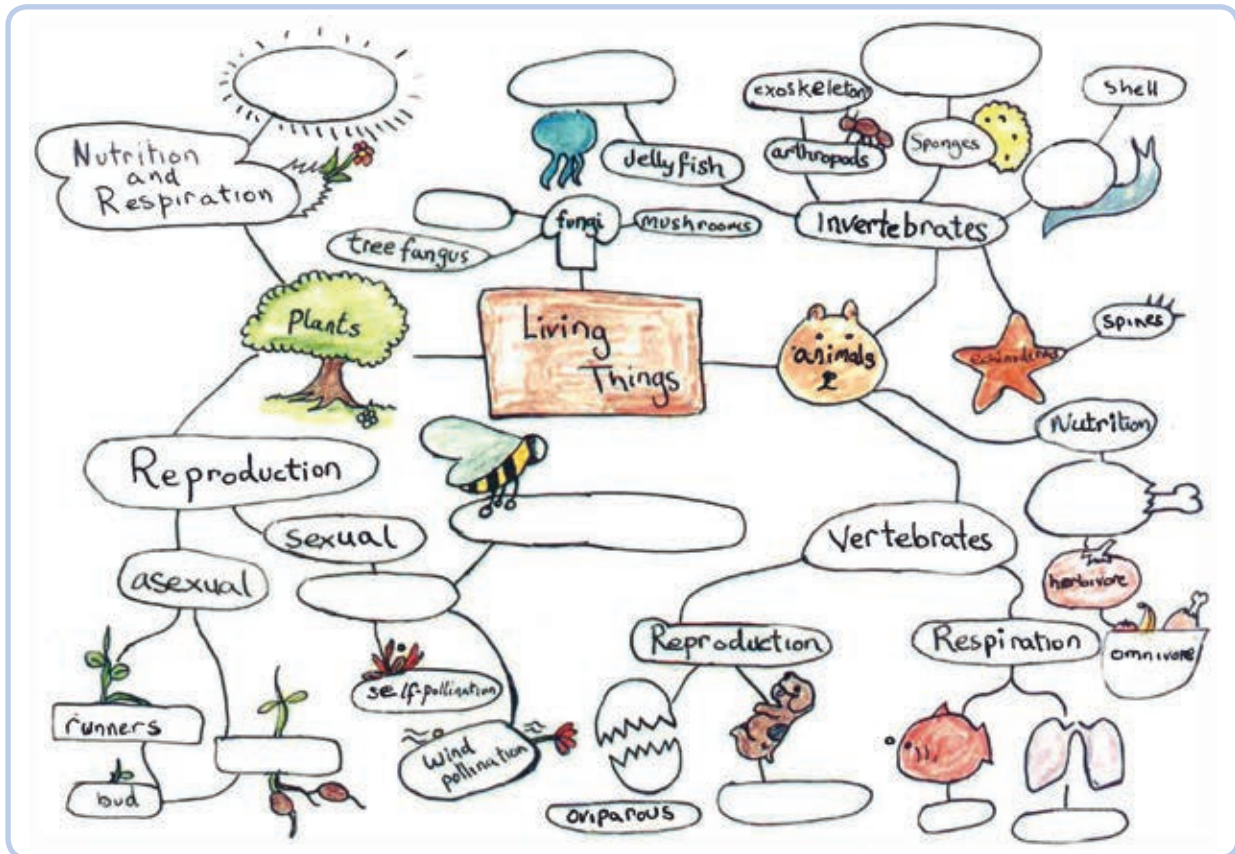
★★★ excellent

**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



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

- a) Add these categories to the concept map: *the structure of living things and ecosystems.*
- b) Compare your concept map with a classmate. Are they the same?
- c) 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?  
What's a habitat?

## GLOSSARY

**bud:** small growth on a plant can grow into a new plant, for example a potato bud.



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

**food chain:** the feeding relationships between living things in an ecosystem.

**gills:** organs that fish use to get oxygen from the water.



**habitat:** the place where living things naturally live.

**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.

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



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

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

**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.

