NATURAL SCIENCE

LEARN TOGETHER

TEACHER'S BOOK

PRIMARY 5

BY ME

COMUNIDAD DE MADRID

TABLE OF CONTENTS

HOW TO USE THE TEACHER'S BOOK

The Teacher's Book is specially designed to help Science teachers and provide English language support. It includes easy-to-follow lesson plans and practical support through each activity, highlighting teaching suggestions and tips.

CONTENT MAPS

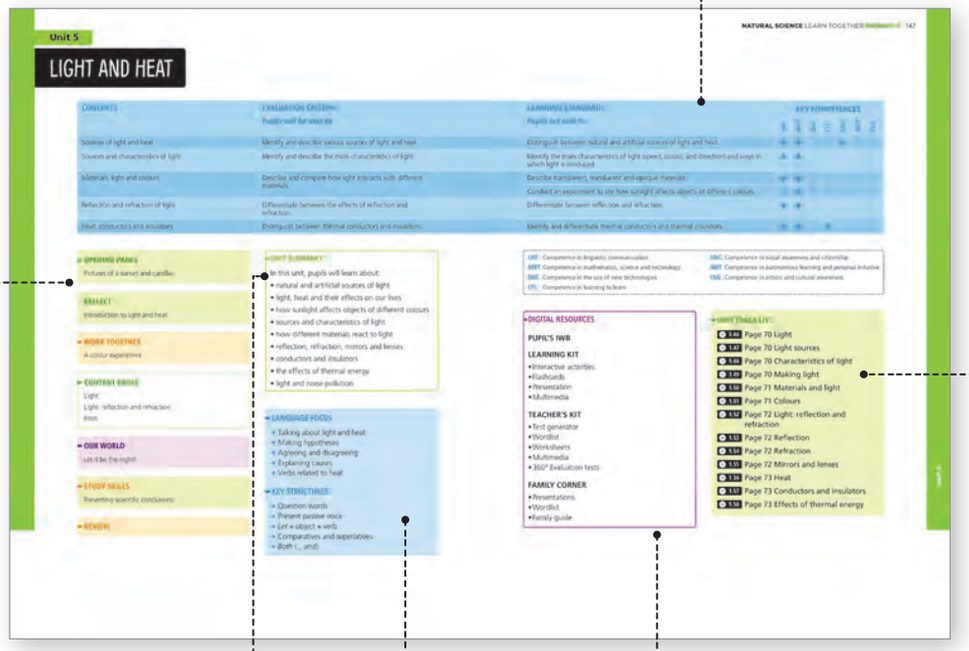
Each unit begins with a content map, fully compatible with the LOMCE curriculum, to help the teacher see at a glance the contents, evaluation criteria, learning standards and key competences ahead.

UNIT STRUCTURE

It provides a quick overview of the different sections within the unit.

CONTENTS, EVALUATION CRITERIA, LEARNING STANDARDS AND KEY COMPETENCES

All key elements of the LOMCE curriculum are clearly mapped out for each unit.



UNIT SUMMARY

It provides an overview of what the pupils will learn in the unit.

LANGUAGE FOCUS & KEY STRUCTURES

It presents a summary of the key language and structures covered in the unit.

DIGITAL RESOURCES

An index of the materials and activities available for each unit through the Digital Resources.

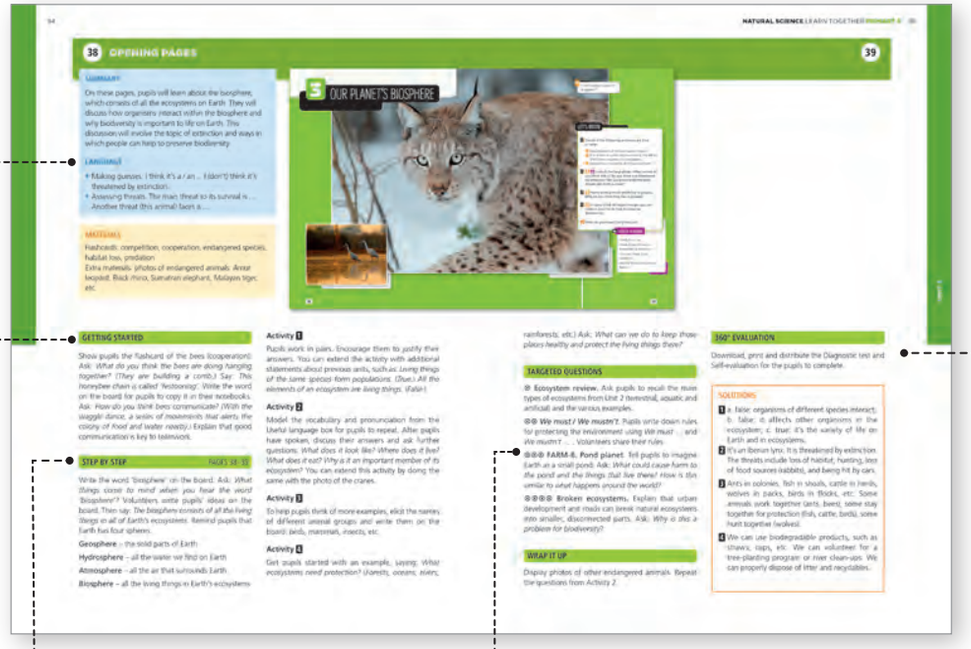
TRACK LIST

An index of the audio tracks on the Teacher's CD.

LESSON PLANS

LESSON INFORMATION AT A GLANCE

Lesson summary, language focus and materials to help prepare lessons ahead of time.



GETTING STARTED AND WRAPPING UP ACTIVITIES

Each lesson begins and ends with activities that aim to preview and review important vocabulary and concepts.

STEP-BY-STEP LESSON PLANS

Teacher tips on presenting textual and graphic content, and instructions for guiding pupils through the activities.

TARGETED QUESTIONS

Questions which vary in level of difficulty to get pupils thinking more critically.

360° EVALUATION

Helps teachers personalise their teaching and target their pupils' needs through a series of evaluation tests: teacher, peer and self-evaluations.

360º EVALUATION

ByME Natural Science 5 Learn Together helps teachers personalise their teaching and target their pupils' real needs.

The material is supported by a 360° evaluation carried out by the teacher, the pupil and his or her peers. All tests and evaluations are tagged with the icon ✅.

The 360° evaluation has three main stages within a unit:

1. Diagnostic stage: includes the teacher diagnostic test and the pupil's self-evaluation. Pupils are asked to take these tests at the unit opening page. These two tests help teachers plan the unit lessons according to their pupils' knowledge.
2. Work with peers stage: represented by the Cooperative Learning evaluation.
3. Assessment stage: comprising the end-of-unit evaluation and the evaluation grid.

TEACHER EVALUATION

The evaluation tests carried out by the teacher include:

- **Diagnostic test:** teachers determine what pupils already know about the unit.
- **End-of-unit test:** pupils carry out a final unit test to check what they have learnt.
- **Unit evaluation grid:** teachers evaluate if the pupils have accomplished the evaluation criteria of the unit.
- **End-of-term test:** pupils take an end-of-term test which serves as an additional evaluation tool for the teacher.

The 360° evaluation wraps up with two term evaluations: the end-of-term test (teacher) and the project evaluation (peer).

All the marks can then be recorded in the unit or term log book, made available to the teacher in the digital resources.

SELF

- **Pupil's self-evaluation:** pupils test their prior knowledge of the unit through a self-assessment grid.

PEER

- **Cooperative Learning evaluation:** pupils complete a self-evaluation grid of the cooperative tasks, evaluating its development, their own performance, as well as the performance of their teammates.
- **Project evaluation:** pupils evaluate the development of the project, their own performance, as well as the performance of their teammates, again from a Cooperative Learning perspective.

COOPERATIVE LEARNING

Cooperative Learning is an educational situation in which pupils are required to work together in small groups or teams to support each other in order to improve their own learning and that of others. Cooperative Learning goes beyond merely seating pupils together; simply telling them they are a group does not mean they will cooperate effectively.

Basic principles of Cooperative Learning

(Johnson, Johnson & Holubec)

1. Positive interdependence

Pupils recognise that with the help of their peers, they can better complete the group's task. Every group member must contribute, and members will depend on each other to complete the task. We can enhance positive interdependence by establishing mutual goals which 'will help each pupil to learn and make sure all other team members learn' (Johnson, Johnson & Holubec, 2008).

2. Individual accountability

Each member of the group is responsible for completing their part of the work and must develop a sense of personal responsibility towards him or herself and the rest of the group, because individual performance will not only affect their own result, but also the results of their team members.

3. Promotive interaction

Cooperative Learning implies face-to-face interaction. Pupils need not only to discuss and agree but also to produce a piece of work through combined effort, because Cooperative Learning is not about working individually to make a 'cut-and-paste' final product.

4. Social abilities

Pupils need interpersonal skills to be successful. Some of them are:

- effective leadership
- decision-making
- communication
- conflict resolution
- helping and asking for help
- organisation
- self-esteem
- self-confidence.

Pupils are not born knowing how to behave in a group. We have to teach them, giving them models, and opportunities to practise these skills.

5. Group processing

Developing Cooperative Learning methodology is not easy at first, nor are the effects immediate. Difficulties within the groups, with resources and with management may arise. That is why formative assessment is needed. This assessment involves both teachers and pupils. We need to know the strong and weak points in order to make the right decisions and develop the methodology in the right direction.

Cooperative Learning structures in *Natural Science 5 Learn Together*

The *Work together* section of the *ByME Natural Science 5 Learn Together* is designed to develop pupils' Cooperative Learning skills through the use of two different types of techniques, Think-Pair-Share and Teammates consult.

These techniques are presented to the pupils in the opening unit with a brief explanation. Here's all you need to know about them!

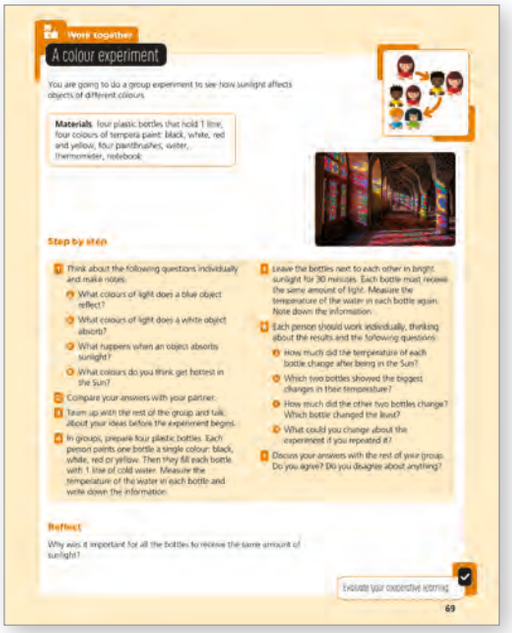
Think-Pair-Share

Pupils are presented with a problem.

First they work on their own and reflect on the problem that has been posed. Make sure that they all try to establish their own ideas on the matter.

Secondly, pupils get together with a partner and work in pairs. Pupils are required to reach agreements with their partners after discussing their opinions.

Finally, the two pairs get together and work as a group and discuss their ideas together and agree on an answer.


Work together

A colour experiment

You are going to do a group experiment to see how sunlight affects objects of different colours.

Materials: four plastic bottles that hold 1 litre, four colours of tempera paint: black, white, red and yellow, four paintbrushes, water, thermometer, notebook

Step by step

1. Think about the following questions individually and make notes:
   - What colours of light does a blue object reflect?
   - What colours of light does a white object absorb?
   - What happens when an object absorbs sunlight?
   - What colours do you think get hottest in the Sun?
2. Compare your answers with your partner.
3. Team up with the rest of the group and talk about your ideas before the experiment begins.
4. In groups, prepare four plastic bottles. Each person paints one bottle a single colour: black, white, red or yellow. Then they fill each bottle with 1 litre of cold water. Measure the temperature of the water in each bottle and write down the information.
5. Leave the bottles next to each other in bright sunlight for 30 minutes. Each bottle must receive the same amount of light. Measure the temperature of the water in each bottle again. Note down the information.
6. Each person should work individually, thinking about the results and the following questions:
   - How much did the temperature of each bottle change after being in the Sun?
   - Which two bottles showed the biggest changes in their temperature?
   - How much did the other two bottles change? Which bottle changed the least?
   - What could you change about the experiment if you repeated it?
7. Discuss your answers with the rest of your group. Do you agree? Do you disagree about anything?

Reflect

Why was it important for all the bottles to receive the same amount of sunlight?

Evaluate your cooperative learning

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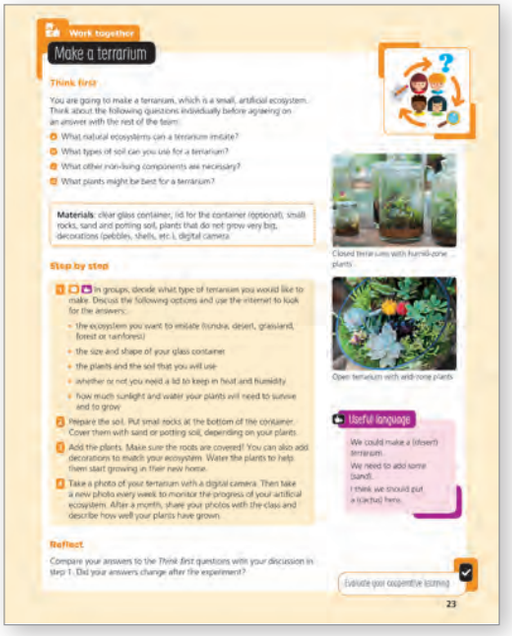
Cooperative investigation

In groups of four, pupils are presented with a problem or question before carrying out an experiment.

The individual members of the group think about the problem or question and create a hypothesis. They share it with the rest of the team, who then decide on a hypothesis as a group.

Next, they do the experiment and write down their conclusions.

Finally, the group compares the original hypothesis with the conclusions they developed after the experiment.


Work together

Make a terrarium

Think first

You are going to make a terrarium, which is a small, artificial ecosystem. Think about the following questions individually before agreeing on an answer with the rest of the team:

- What natural ecosystems can a terrarium imitate?
- What types of soil can you use for a terrarium?
- What other non-living components are necessary?
- What plants might be best for a terrarium?

Materials: clear glass container, lid for the container (optional), small rocks, sand and potting soil, plants that do not grow very big, decorations (pebbles, shells, etc.), digital camera

Closed terrarium with humid-zone plants

Step by step

1. In groups, decide what type of terrarium you would like to make. Discuss the following options and use the internet to look for the answers:
   - the ecosystem you want to imitate (tundra, desert, grassland, forest or rainforest)
   - the size and shape of your glass container
   - the plants and the soil that you will use
   - whether or not you need a lid to keep in heat and humidity
   - how much sunlight and water your plants will need to survive and to grow
2. Prepare the soil. Put small rocks at the bottom of the container. Cover them with sand or potting soil, depending on your plants.
3. Add the plants. Make sure the roots are covered! You can also add decorations to match your ecosystem. Water the plants to help them start growing in their new home.
4. Take a photo of your terrarium with a digital camera. Then take a new photo every week to monitor the progress of your artificial ecosystem. After a month, share your photos with the class and describe how well your plants have grown.

Open terrarium with wild-zone plants

Useful language

We could make a (closed) terrarium.
We need to add some (sand).
I think we should put a (cactus) here.

Reflect

Compare your answers to the *Think first* questions with your discussion in step 1. Did your answers change after the experiment?

Evaluate your cooperative learning

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PROJECT BASED LEARNING

The Buck Institute for Education (BIE) defines Project Based Learning (PBL) as 'an extended process of enquiry' where 'students work on a project over an extended period of time that engages them in solving a real-world problem or answering a complex question. As a result, students develop deep content knowledge as well as critical thinking, creativity and communication skills in the context of doing an authentic, meaningful project.'

ByME Natural Science Learn Together projects are clearly organised to help pupils make a successful start in Project Based Learning. Each project relates to what the pupils have learnt in the preceding units and the theme running through all the projects is to make the world a better place.

CHALLENGE

Every project begins with a challenging problem or driving question. The problem or question sparks the pupils' interest and motivates them to want to find the solution. In some cases pupils are asked to choose from a range of possible options for the project, such as choosing a song that will be used to create a dance routine or a dish to create a healthy menu.

WHAT DO YOU KNOW?

These activities are meant to revise and activate the contents pupils have studied in the preceding units and that are related to the project. It is therefore a first chance to begin the enquiry process that will lead them to a satisfactory solution of the problem.

PROJECT **The new houses!**

The local government wants to build some new houses. They are planning to cut down most of the trees in a forest near the town centre. This will create land for the new houses. However, an environmental group is against the idea. They need your help to convince the local government not to cut down the trees. Are you ready? Let's start!

Before you start, it is important to find out what you already know about biodiversity.

1 In your notebook, answer the following questions.

a What is a biosphere?
b What is a food chain?
c What is a food web?
d Why is biodiversity important?
e What is an endangered species?
f What is a biosphere reserve?

2 How can the following things affect biodiversity? Answer in your notebook.

Have you got a team? What are you waiting for?! Get together in groups of four.

3 Decide on the roles in your group.

coordinator secretary spokesperson materials manager

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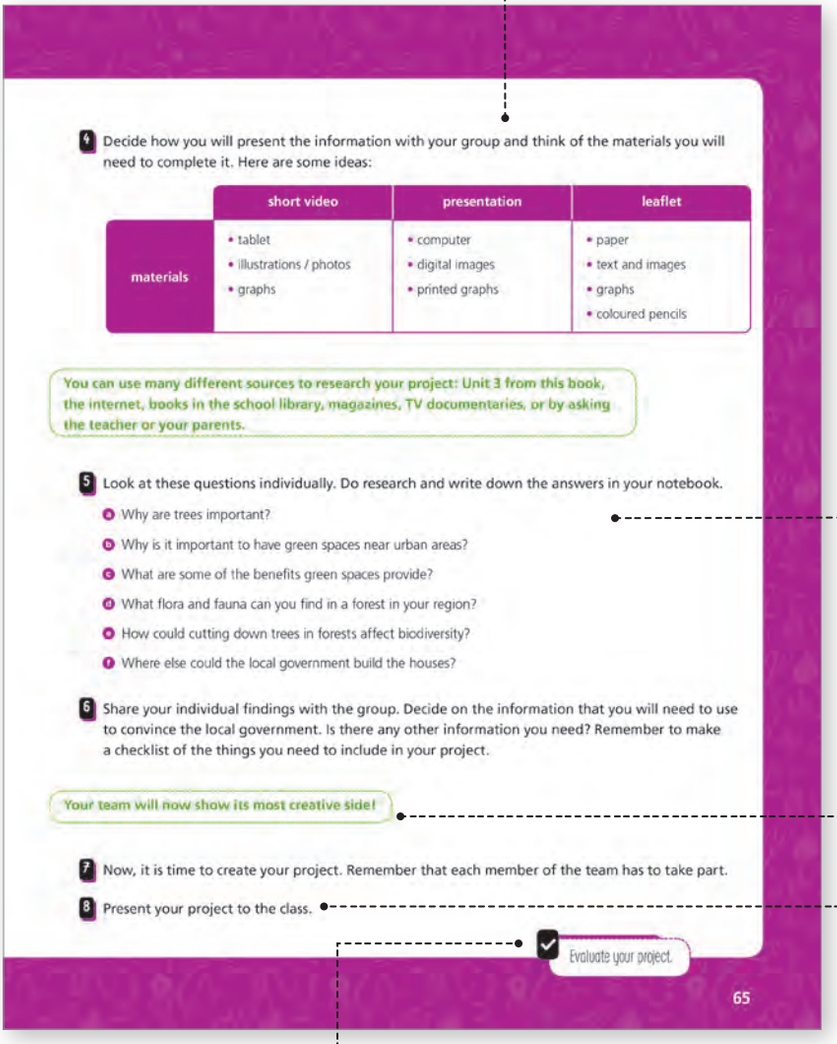
TEAM ORGANISATION

Cooperative work and each participant's role are key to their successfully completing the project. Before proceeding with the rest of the enquiry, pupils decide how they are going to organise themselves as a team. PBL applies Cooperative Learning techniques, therefore the team organisation is based on roles. The proposed roles are coordinator, secretary, materials manager and spokesperson, but you may decide to introduce other roles.

PROJECT ORGANISATION

At this stage, pupils decide on the format of their project. They are given different options to choose from along with the materials required, however they are also free to choose their own format if they wish.



4 Decide how you will present the information with your group and think of the materials you will need to complete it. Here are some ideas:

	short video	presentation	leaflet
materials	• tablet • illustrations / photos • graphs	• computer • digital images • printed graphs	• paper • text and images • graphs • coloured pencils

You can use many different sources to research your project: Unit 3 from this book, the internet, books in the school library, magazines, TV documentaries, or by asking the teacher or your parents.

5 Look at these questions individually. Do research and write down the answers in your notebook.

a Why are trees important?
b Why is it important to have green spaces near urban areas?
c What are some of the benefits green spaces provide?
d What flora and fauna can you find in a forest in your region?
e How could cutting down trees in forests affect biodiversity?
f Where else could the local government build the houses?

6 Share your individual findings with the group. Decide on the information that you will need to use to convince the local government. Is there any other information you need? Remember to make a checklist of the things you need to include in your project.

Your team will now show its most creative side!

7 Now, it is time to create your project. Remember that each member of the team has to take part.

8 Present your project to the class.

Evaluate your project.

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RESEARCH

Once pupils have decided how they are going to present their project, they undertake research to answer to a set of questions that will help them complete their project. In doing so, they will need to use various sources such as the Pupil's Book itself, the internet, books in the school library, magazines, visiting museums, or by asking the teacher or their parents.

CREATE

At this stage the team members will create their project or product. They have all the necessary information, they have discussed all their findings and they have agreed what they want it to be like, so there is no time to waste!

PROJECT EVALUATION

The pupils evaluate the development of the project, their own performance, as well as the performance of their teammates from a Cooperative Learning perspective.

PRESENT YOUR PROJECT

Pupils share their findings by presenting their project to the rest of the class, or if you choose, to the rest of the school. Remind the pupils that they should be ready to answer any questions at the end of their presentations!

HELPFUL TIPS

The following tips are arranged as an activity bank and will help you to get the most out of the ByME educational materials, add diversity to your classes, and maintain your pupils engaged and motivated.

PRESENTING KEY CONTENT

The ByME Pupil's Books for Level 5 present large amounts of information in both textual and visual formats. At this level, pupils continue to develop their literacy skills. To encourage active participation and develop confidence at this level, teachers are recommended to use a variety of reading activities to help pupils develop fluency and confidence while reading. There are a variety of activities that can be done before, during and after reading to help pupils get the most out of the text.

Before reading

Skimming and scanning: The teacher asks pupils to look at the pictures on the page and scan the text for keywords. Then the pupils make predictions about what they will be reading about.


Our world

Let it be the night!

Artificial light is rapidly becoming a major astronomical disruption all around the globe. In big cities the night sky is 25 to 50 times brighter than the natural sky. Sky glow results in waste of light and energy.

1 Get into pairs. Person A reads text A below. Person B reads text B on page 95. Together, decide if the sentences below refer to text A, B or both.

Unit 5, text A

The light bulb is one of the most significant inventions of all time. Just for one second, imagine your life without lighting! However, an increase in the planet's population and growing demand for artificial light can both cause light pollution.

The main types of light pollution are: urban sky glow, which is excessive lighting in urban areas; light trespass, unnecessary light falling on places; and glare, brightness causing discomfort and poor visibility.

Light pollution has a negative impact on the environment, wildlife and our health. Astronomers must travel far to be able to observe the night sky. Light pollution affects nocturnal animals such as owls, which use moonlight to hunt. Dark nights are essential for our health and brain activity. Start by telling your family and friends about this problem and find ways to reduce it.

Europe at night seen from space

Hong Kong, night skyline view

- There is a growing demand for this light source.
- Both light pollution and noise pollution disrupt wildlife.
- The illumination of the night sky in urban areas.
- Loud noise and excessive lighting can result in sleep loss.
- With your friends, think of ways to help stop pollution.

2 Do research online about nocturnal animals and marine animals that are affected by light pollution and noise pollution. Make a list of the animals and how they are affected. Tell the class. Then think of ways to raise awareness and make your school and home more animal-friendly.

Useful language

(Whales and cod) are affected by ...

Because of light pollution (owls and migrating birds) lose ...

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Word meanings: Pupils look through the text to find unfamiliar words. These words can be defined by other pupils, the teacher or with the use of a dictionary.

During reading

Cause and effect: Pupils look for examples of cause and effect in the text. The cause explains why something happened. The effect is the description of what happened.

Cloze reading: The teacher reads the text and pauses at keywords to have the pupils read the word that follows.

Jigsaw comprehensions: Prepare two versions of a text taken or adapted from the Pupil's Book. Pupil A has information about a topic but questions about a different topic. Pupil B has the complimentary text and questions for Pupil A's text. The pupils read their own text and then their questions about the other text. Their partners then correct their work together.

Small group reading: Pupils are divided into small groups. The groups can be heterogeneous to allow stronger readers to support other pupils. Or the groups can be homogeneous and the teacher can work with the group of readers that need more support.

Listening: The teacher reads the text with clear intonation and pronunciation while the pupils follow along in their books.

Main idea: Pupils look for the sentence that describes the main idea of the paragraph.

Order reading: The teacher instructs pupils of the order in which they will read the text. One pupil reads one sentence. The next pupil reads the following and so forth.

Pairwork gap fills: Prepare two versions of a text taken or adapted from the Pupil's Book. Remove key vocabulary from the text making sure the missing words are different in the two versions. Ask the pupils to work with a partner to find the missing words by asking each other questions.

Partner reading: Pupils read with a partner. Each pupil takes turn reading and listening.

Re-reading: Reading texts multiple times is an important activity that can promote better

understanding of the main concepts, increase fluency and ensure participation from all pupils.

Silent reading: Pupils are provided with time to read the text silently on their own.

Word meanings in context: The teacher encourages pupils to define new words and important vocabulary by using the text in the sentence around it.

After reading

Asking questions: Pupils use the information from the text to ask new questions that require further information.

Collaborative reading: The pupils work in groups each with a different text box. They read their text together, choosing the important information. The groups are remade with one pupil from each original group. Each one explains what they have learnt from their reading. They then return to their original group and share the new information. This is especially effective when reading text boxes.

Compare and contrast: Pupils take two main concepts and discuss how they are different and how they are similar.

Drawing conclusions: Pupils use the information they already know and the information from the text to draw conclusions.

Making connections: Pupils focus on new vocabulary or a new concept and make a connection to their own life and experiences.

Paraphrasing: Pupils use their own words to retell what they have just read.

Sequence: Pupils discuss or write the sequence of a process or event.

Summarising: Pupils use keywords to describe the main idea of the text.

GETTING THE MOST OUT OF THE CLASSROOM MATERIALS

Posters and flashcards can be used in endless ways, from presenting or consolidating concepts or vocabulary to providing revision before the end-of-unit tests or at the beginning of a lesson. Here are a number of ideas to help get the most out of these useful resources:

Posters

Classroom resource: Use posters as a resource in the classroom, serving as a reminder of the topic, even once it has been completed.

Definitions: Choose an item on the posters and ask the pupils to give a definition of it. *A lynx is a tertiary consumer. It feeds on (rabbits).*

Fast finishers: Pupils who have finished their activities can play with a poster in pairs or in a small group. One can name an item and the other has to find it on the poster. Pupils could also label the poster or choose an item from it while their partner has to discover which item they have chosen.

Focus pupils' attention: Leave a poster on display throughout the duration of the topic. Use it to focus the pupils' attention whenever necessary.

Guess what I am thinking of: Choose an item on a poster and encourage the pupils to guess what you are thinking about. Insist that they use full sentences: *Does this organism belong to the Monera Kingdom? No, it doesn't.*

Introducing a topic: The posters can be used to introduce a topic. They also serve as a starting point for discussion. They can be used for checking any concepts and vocabulary the pupils may already know. Display the poster and ask the pupils: *What can you see?*

I-spy: Use posters at the beginning of lessons to review vocabulary and warm up the whole class by choosing an item from the poster.

Labelling with word cards: Display posters and show the pupils the word cards. Have them match them to the items on the poster and then read them.

Memory: Give the pupils one minute to look at a poster and remember as many details as they can. Cover the poster with a piece of card. Ask the pupils to name things they recall from the poster.

Poster Pictionary: Invite a pupil to choose an item from a poster and begin to draw it. The rest of the pupils have to guess what they are drawing.

Visual aid: Use posters as visual support for games such as 'Odd one out' played with word cards or orally.

Flashcards

Learning to learn game: On completion of a unit, or in order to review past concepts, write headings and boxes on the board and with the pupils, build up a concept map.

Memory game: *I went to the shop and I bought…*: This traditional memory game can be adapted to practise key vocabulary. The game involves the pupils remembering the words said before their turn and adding one more item to the list. *In my house we have a toaster. In my house we have a toaster and a TV.*

Quick flash: Quickly display then hide a group of flashcards. The pupils say the word they saw.

Spelling duel: Invite two pupils to come to the board. Explain that you want them to take part in a spelling dual. Ask the pupils to write the word you say on the board. Warn them to keep their word protected so that their opponent can't see it. Ask them to write the word clearly. (It's best to use capital letters to avoid arguments.) When both pupils have written the word the class says: Let's see the flashcard! The winner is the pupil who has written the word correctly.

MORE ACTIVITIES

Dictations 1 (Relay dictations): Prepare copies of the text from the unit so that each group has their own copy. Place the copies around the classroom so that the groups don't get in each other's way. Explain that they must take turns to go to their copy of the text in the classroom to memorise a sentence or part of a sentence in order to dictate it to their group. The pupil who writes the dictated sentence then goes to memorise the next part. When a group finishes, check the dictation. If there is a mistake in the writing they must continue until it is correct.

Dictations 2 (Pairwork dictations): Ask the pupils to choose three sentences from a text and to copy them on to a piece of paper. Ask pupil A to dictate their sentences to pupil B who writes the sentences on a piece of paper. Pupil B then dictates their sentences to pupil A. The work is corrected by the pupils. It isn't important if the sentences are duplicated but you may like to assign different texts to pupils A and pupils B.

Odd one out: Choose three words from one group and one distracter: *producers, consumers, biosphere, decomposers.* Write them on the board in a random order and ask: *Which is the odd one out? The biosphere does not form part of a food chain.* Encourage pupils to name the card that is different and to tell you why.

Spelling practice: In Level 5, it is very important to encourage the pupils to be independent learners: ask them to choose words they have learnt in the unit and then put them in pairs. Tell them to take turns to dictate their words to their partner. They then correct their work together.

Vocabulary review: Get into the routine of revising key vocabulary the pupils have covered in the previous lesson at the start of the following class. Encourage the pupils to become independent learners: ask them to choose any word they have learnt, and then put them in pairs to ask and answer what the words mean. Pupil A: *What is a community?* Pupil B: *When populations interact with each other, they form a community.*

Noughts and crosses: Draw a noughts and crosses grid on the board and divide the class into two teams. Give a definition of a word and ask the pupils if it is true or false. If their answer is correct, invite them to choose a square on the grid to write their nought or cross. This game can also be played by giving a definition and the teams giving the word.

Quiz makers: At the end of a unit ask the pupils to work with a partner or divide the class into groups and invite them to make questions for a quiz about the topic. Tell them that they can use the Pupil's Book to help them. Remind them that they must also supply the answers to their questions. Take in their papers and use the questions to give the class a quiz. Read the questions to the class and ask them to write their answers on a paper. Paraphrase the questions so that the pupils can answer in a few words. They

then exchange papers and the quiz is corrected collectively.

True or false: Prepare a series of statements about the content studied in the unit. These should be a variety of true and false statements. When the pupils hear the statement they indicate if they believe it to be true or false. There are many ways to do this. Pupils can raise their hands, stand up, clap or jump to left and right of an imaginary line in the classroom. If the sentence is false, ask volunteers to correct the statement.

Vocabulary storms: As an introductory activity to a new topic, divide the class into groups and ask them to write down as many words as they can that are related to the topic that is going to be studied. At the end of the group activity, invite pupils to share their work with the rest of the class. Encourage the pupils to come to the board and use mind maps to organise the words from their lists.

WELCOME LETTER HOME

Dear Parent / Carer,

This year, your child will be learning about Natural Science in English, developing an understanding of many different aspects of the natural world we live in, all while being introduced to new vocabulary and reinforcing grammatical structures. This is the fifth level in a six-level course designed for pupils at the primary level.

Learning about science is very beneficial for children because it complements a child's natural curiosity and answers a lot of their questions they have about the world we live in. The acquisition of science learning is practical and relevant, which children embrace without even thinking about it. This course aims to provide your child with the opportunities to learn and discuss the curiosities they may have about the world we live in today, as well as how it was in the past, while strengthening and building upon their English grammar and vocabulary.

In Level 5, the first three units of the course will cover the living things and their characteristics, and the Earth's biosphere and ecosystems. The course looks at how living organisms interact with each other in a habitat and the major threats to biodiversity and the planet's survival.

In the final three units of the course, your child will learn about energy and its different forms. Your child will become familiar with renewable and non-renewable energy sources and their environmental impact. They will also learn about light and heat and their properties and effects. Finally, your child will learn about electricity and how it has changed our lives.

The opportunities to use new language will be present throughout this course, which integrates new structures and vocabulary in every unit. Your child will also be able to put this new language into use during hands-on learning situations when they carry out group projects at the beginning of each unit. Learning science and doing these group activities involves a lot of talking and listening to each other, as well as developing patience and problem solving, too.

You and your child will both find value in the life skills learnt from this course, which your child will be able to apply to real life situations throughout their life. Perseverance, problem solving, independent thinking and researching along with the reinforcement of English communication skills are only to name a few.

Thank you in advance for your support and collaboration. Here's to a great year of growth and learning!

Best wishes,

Science teacher

Notes

TOGETHER AGAIN!

4 TOGETHER AGAIN!

SUMMARY

The aim of this lesson is to give pupils an overview of the course. They will discuss an introductory text and look at the key topics of this course. The *Work together* pages consist of having pupils work together, maximising their learning and increasing pupil interaction. There are two types of *Work together* pages in this book: *Cooperative investigation* and *Think-Pair-Share*.

LANGUAGE

- Simple present for acts, habits and routines
- Talking about plans: We're going to (do an experiment).
- Science topics: biodiversity, biosphere, ecosystem, electricity, energy, habitat loss, environmental threats, green power
- Collocations: do / carry out an experiment with / on; an experiment shows / proves / demonstrates something; an experiment to test; come to / draw a conclusion

MATERIALS

Coloured paper, Scotch tape, various felt-tip pens, a potted plant.


TOGETHER AGAIN!

Read the text and answer the questions below in your notebook.

It is hard to imagine a world without energy. Energy constantly flows around us and through us. It is present in sunlight, in wind, in water and in sound. Electricity is one of the most important forms of energy. The proper function of so many things today relies on electrical power.

Energy is one of the most significant factors for biodiversity, too. Biodiversity can be defined as the richness of life that exists on our planet. Ecosystems evolve over thousands of years and they are in delicate balance. Habitat loss is probably the fastest growing threat to our survival and to the life forms that surround us. Now more than ever we need to protect and save the environment for the good of mankind.

1 What is the one thing that constantly flows around and through us? Where can you see or feel it?
2 How can you define biodiversity?
3 What is the key factor for biodiversity?
4 What is the greatest threat to ecological balance? Can you think of any other?

In this book, you will learn about:
- living things and ecosystems
- food chains and food webs
- loss of biodiversity and how to protect the biosphere
- forms of energy
- renewable and non-renewable energy sources
- light and heat
- electricity and inventions

4

GETTING STARTED

Write on the board: *What is energy?* In pairs, have pupils brainstorm to make a list of things energy is used for. Volunteers write their ideas on coloured paper and stick it on the board. Then ask: *What do you know about green power?*

STEP BY STEP PAGE 4

- Discuss the photo. Ask: *What do you see in the picture? What is the person holding? (Light bulb.) Is it on or off? (On.) What does a light bulb need to produce light? (Electricity.)*
- Have two volunteers read the text. Ask pupils to name key words and give a definition for each.
- Explain that pupils are going to play a guessing game. Invite a volunteer to come to the board and hand them a flashcard. Then pupils ask questions: *Is it an object? Is it an animal?* The volunteer answers: *Yes, it is / No, it isn't.* Pupils keep asking questions until they guess the picture. Remind pupils that during the course it is important to work together and help each other.

Activity 1

Have pupils close their eyes and stay quiet and still. Ask them to think of ways their bodies are using energy. Then ask: *In what other ways do we use energy in our everyday life?*

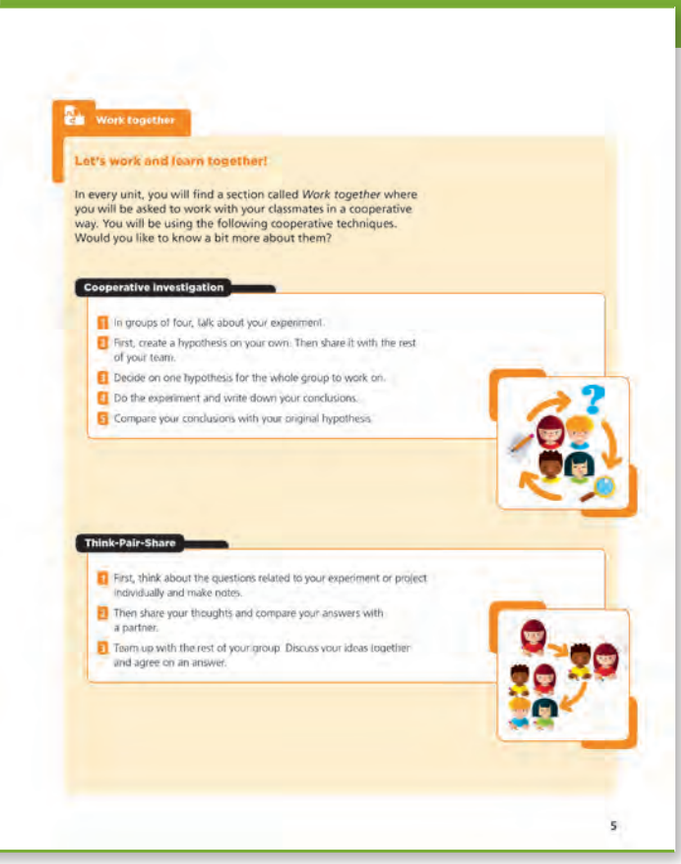
Activity 2 and 3

Discuss a possible definition for *biodiversity* as a class. Then ask: *Why do you think biodiversity is important?* Write pupils' ideas on the board.

Activity 4

Elicit answers to these questions: *How long does it take ecosystems to evolve? What causes habitat loss?* Then write on the board: *Think green*. Pupils brainstorm ideas for protecting the environment. They make notes in their notebooks.

5



Work together

Let's work and learn together!

In every unit, you will find a section called *Work together* where you will be asked to work with your classmates in a cooperative way. You will be using the following cooperative techniques. Would you like to know a bit more about them?

Cooperative investigation

1. In groups of four, talk about your experiment.
2. First, create a hypothesis on your own. Then share it with the rest of your team.
3. Decide on one hypothesis for the whole group to work on.
4. Do the experiment and write down your conclusions.
5. Compare your conclusions with your original hypothesis.

Think-Pair-Share

1. First, think about the questions related to your experiment or project individually and make notes.
2. Then share your thoughts and compare your answers with a partner.
3. Team up with the rest of your group. Discuss your ideas together and agree on an answer.

5

Cooperative investigation

- Invite volunteers to read each of the five steps. Explain that a hypothesis is a guess about what we think will happen.
- Show the potted plant. Ask: *What will happen if we don't water this plant? We can make a hypothesis (The plant will die.). Then we do an experiment. We use two plants but only water one of them. We observe what happens and draw our conclusions.*
- Elicit other experiments that pupils have done at school in the past. Ask: *What was the hypothesis? How did you test it? What were the conclusions?*

Think-Pair-Share

- Explain *Think-Pair-Share* activities to pupils. They first work alone, so when you say *think* they must be quiet and consider the question. After working alone they work in pairs, so when you say *pair* they must work with their partner. After working in pairs they work in groups, so when you say *share* they must form groups of four.
- Elicit the qualities and skills we need to have when working in pairs or groups (*listening and thinking skills, patience, organisation, responsibility, etc.*).

WRAP IT UP

- Write ten random letters on the board. Pupils work in groups to write ten words related to science that begin with those letters (e.g., A = animal, B = biodiversity, etc.). Write their answers on the board. You can repeat the task with another ten letters.
- Ask pupils if they can think of any advantages to working in these ways (possible answers*: they can help each other, hear new ideas, share the workload and learn new skills, deal with and resolve any difficulties, gain confidence, etc.).*

SOLUTIONS

1 Energy; in sunlight, wind, water sound, and within us

2 The richness of life that exists on our planet.

3 Energy is the key factor.

4 Habitat loss; pollution; global warming

Notes

LIVING THINGS

Unit 1

LIVING THINGS

CONTENTS	EVALUATION CRITERIA Pupils will be able to:	
Description of living things	Describe living things and their main characteristics.	
Life processes: nutrition, reproduction, interaction	Identify the main life processes of living things.	
Plant and animal cells	Describe the structure of plant and animal cells.	
Cells, tissues, organs and systems	Identify specialised plant and animal cells and their functions. Describe how cells form tissues, tissues form organs and organs form systems.	
Classification of living things: the five kingdoms	Know the different groups living things belong to, describing their main characteristics.	

OPENING PAGES

Pictures of unicellular protozoa, algae and the bottom of sea

REFLECT

Introduction to living and non-living things

WORK TOGETHER

Grow your own bacteria

CONTENT PAGES

Characteristics of living things
Life processes
Cells, tissues, organs and systems
How living things are classified

OUR WORLD

Life-changing inventions

STUDY SKILLS

Testing a hypothesis

REVIEW

UNIT SUMMARY

In this unit, pupils will learn about:

- differences between living and non-living things
- unicellular and multicellular organisms
- characteristics and life processes of living things
- differences between plant and animal cells
- how specialised cells form other structures
- classification of living things into kingdoms

LANGUAGE FOCUS

- Describing photos
- Making guesses
- Explaining a process
- Relative pronouns: *that* and *which*
- Discussing ability: can and can't
- Regular and irregular plurals
- Present passive voice

KEY STRUCTURES

- *Need* + object + infinitive
- *Allow* + object + infinitive
- Virus / viruses; fungus / fungi; bacterium / bacteria
- I can see… I can't see…
- I think… I don't think…

LEARNING STANDARDS Pupils are able to:	KEY COMPETENCES						
	LIN	MST	DIG	LTL	SOC	AUT	CUL
Identify unicellular and multicellular organisms.	●	●					
Identify and describe the main features and functions of living things.	●	●					
Learn about the main life processes and how each one is carried out.		●					
Identify specific organisms as living things based on the three main life processes.	●	●					
Identify the essential differences between plant and animal cells.		●					
Describe specialised cells and their functions.	●	●					
Understand how cells form tissues, organs, systems and organisms.		●					
Classify living things into Whittaker's five kingdoms, considering their main characteristics.	●	●		●			
Conduct an experiment to grow bacterial cultures, making hypotheses and predictions.		●					

LIN Competence in linguistic communication
MST Competence in mathematics, science and technology
DIG Competence in the use of new technologies
LTL Competence in learning to learn
SOC Competence in social awareness and citizenship
AUT Competence in autonomous learning and personal initiative
CUL Competence in artistic and cultural awareness

DIGITAL RESOURCES

PUPIL'S IWB

LEARNING KIT

- Interactive activities
- Flashcards
- Presentation
- Multimedia

TEACHER'S KIT

- Test generator
- Wordlist
- Worksheets
- Multimedia
- 360° Evaluation tests

FAMILY CORNER

- Presentations
- Wordlist
- Family guide

UNIT TRACK LIST

6 OPENING PAGES

SUMMARY

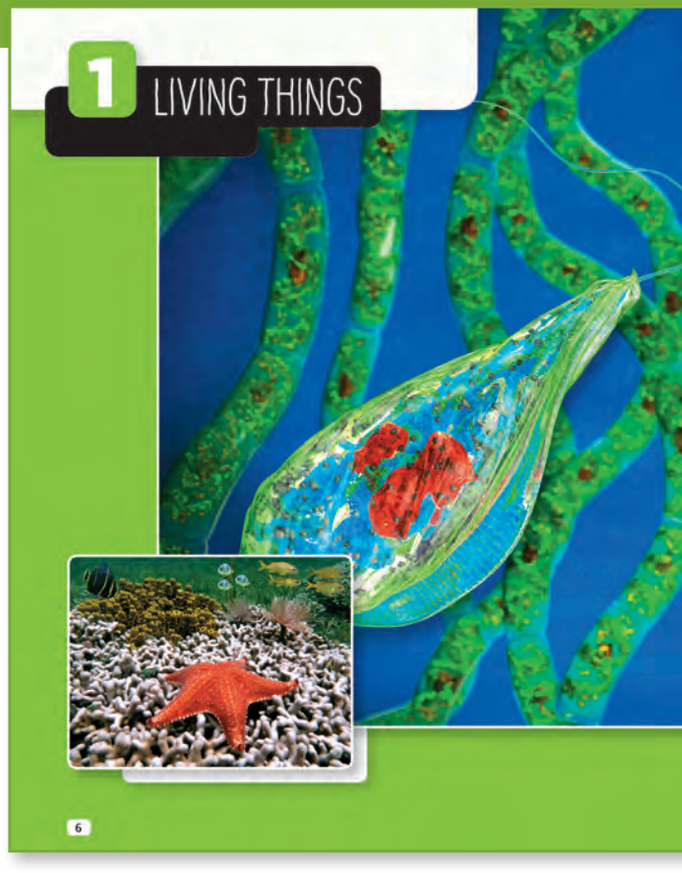
The aim of the unit opener is to activate pupils' prior knowledge of the topic and stimulate their curiosity for what they are about to learn. These pages will introduce pupils to the differences between living and non-living things. Pupils will identify examples of living things and discuss the main life processes. They will also revise their understanding of unicellular and multicellular organisms and the kingdoms to which they belong.

LANGUAGE

- Describing photos: I can see …
- Making guesses: I think … is … It belongs to …

MATERIALS

Flashcards: multicellular organism, unicellular organism.
Extra materials: a living plant and a plastic plant.



GETTING STARTED

Show pupils two plants – one living and one made of plastic. Ask: *How are these two plants similar? How are they different?* Encourage a variety of responses: *They are both green. One of them grows, but the other one doesn't because it's plastic.*

STEP BY STEP PAGES 6-7

Invite a volunteer to read the question box at the top of page 7. Encourage pupils to brainstorm and compare their answers. Explain that they will learn the answers to these questions during the lesson.

Activity 1

Ask pupils which words they know. Volunteers describe each thing: *Mushrooms grow in the forest. Butterflies are insects with wings.* Pupils copy the words into the vocabulary lists in their notebooks. You can extend this activity by showing flashcards of living and non-living things.

Activity 2

Remind pupils that all living things perform certain life processes. Encourage pupils to share what they know about the three main processes: *nutrition, reproduction* and *interaction*. Invite a volunteer to write pupils' answers on the board.

Activity 3

Say: *What is true about all living things?* Elicit the answer: *They eventually die. They stop living.* Point out that living things can have different lifespans. *Mayflies only live a day, while turtles can live for more than a hundred years.*

Activity 4

Point out the Useful language box on page 7 and model the phrases for the class. Write pupils' ideas on the board. Pupils add the words *fish, starfish, coral* and *bacteria* to their vocabulary lists. Then ask: *Which kingdoms do these living things belong to?* Explain that bacteria belong to a kingdom called Monera.

Activity 5

Ask the class what they think the difference is between unicellular and multicellular organisms. Elicit examples of multicellular organisms in increasing order of size and complexity, such as *insect, fish, frog, crocodile, eagle, bear* and *whale*.

7

TARGETED QUESTIONS

⊙ **Is it living or not?** Dictate the names of things that pupils may know and ask them to say which are living and which are non-living.

⊙⊙ **Letter lists.** Have pupils work in groups. Write 10 random letters on the board. Pupils write the names of 10 living things that begin with those letters. Set a limit of three minutes.

⊙⊙⊙ **FARM-B.** Write the mnemonic FARM-B on the board. Explain that there is a letter for each type of vertebrate animal. Elicit the names (*fish*, *amphibian*, *reptile*, *mammal* and *bird*) and then ask pupils to write two or more examples for each type.

⊙⊙⊙⊙ **What is more important?** Ask pupils which life processes are the most important for living things. Tell them to rank the processes in order from the most to the least important and explain their ideas.

WRAP IT UP

Remind pupils of the questions at the top of page 7. Ask if they have learned the answers in this lesson. Elicit answers from volunteers. Then ask: *What other interesting facts did you learn? Did anything surprise you today? What facts did you already know? Do you have any questions or doubts?*

360° EVALUATION

Download, print and distribute the Diagnostic test and Self-evaluation for the pupils to complete.

SOLUTIONS

1. Living: daisy, mushroom, virus, butterfly; non-living: air, rock
2. Nutrition, reproduction and interaction
3. They all die / stop living.
4. Living: fish, starfish, coral, bacteria; non-living: water
5. Unicellular organisms have one cell; multicellular organisms have more than one cell.

8 REFLECT

SUMMARY

Pupils will distinguish between living and non-living things and learn about the characteristics that all living things share. Pupils will discuss microscopic life (bacteria) and the possibility of extra-terrestrial life, in order to develop critical and creative thinking skills.

LANGUAGE

- Describing living and non-living things: Marbles are not living things. Sunflowers grow. Bees reproduce.
- Describing plant nutrition: Plants make their own food. They use sunlight. They need energy to live and grow.
- Making guesses: I (don't) think ...

MATERIALS

Flashcards: chameleon, marbles.
Extra materials: diagram of the solar system with images of the eight planets.


Reflect

1 Look at the photos and identify the living and the non-living things. What is a non-living thing?

marbles, sunflowers, rain drops, chameleons, seeds, sand, bees, clouds

2 What characteristics describe living things? Copy the table below in your notebook.
a Write the characteristics at the top of each column.
b Write the names of the living things in the first column. Then put tick or a cross.

	characteristics				
living things	...	grow	...	reproduce	...
sunflowers	...	✓	...	...	...
...	...	...	...	...	...

3 What is the name of the process in which plants make their own food? In your notebook, explain why this process is vital.

4 Bacteria are microscopic organisms made up of just one cell.
a Are bacteria animals? Are they plants?
b Do you know which kingdom bacteria belong to?

5 Do you think there is life on other planets? What living and non-living things do you think we could find on another planet?

Salmonella bacteria

8

GETTING STARTED

Say names of living and non-living things. When pupils hear a living thing, they clap once. When they hear a non-living thing, they snap their fingers.

STEP BY STEP PAGE 8

Activity 1

On the board, write *I think* and *I don't think*. Model the phrases: *I (don't) think (fish) are living things,* etc. Encourage pupils to use the phrases for the task.

Activity 2

Pupils brainstorm characteristics of living things, then complete the task.

Activity 3

Explain that all livings things need energy to function well. Ask: *How do we get energy to grow? How do other living things get energy to grow?*

Activity 4

Ask pupils what they know about bacteria and kingdoms: *What characteristics do you think bacteria have? Can you name any examples of bacteria?*

Activity 5

Show a diagram of the solar system. Ask pupils to imagine what things might live on the other planets.

WRAP IT UP

Draw a mind map on the board. Write *living things* in the centre and elicit characteristics. Then elicit verbs related to those concepts (*eat, drink, get energy, breathe, grow, reproduce, sense, feel*).

SOLUTIONS

1 Living things: sunflowers, chameleons, seeds, bees; non-living things: marbles, raindrops, sand, clouds

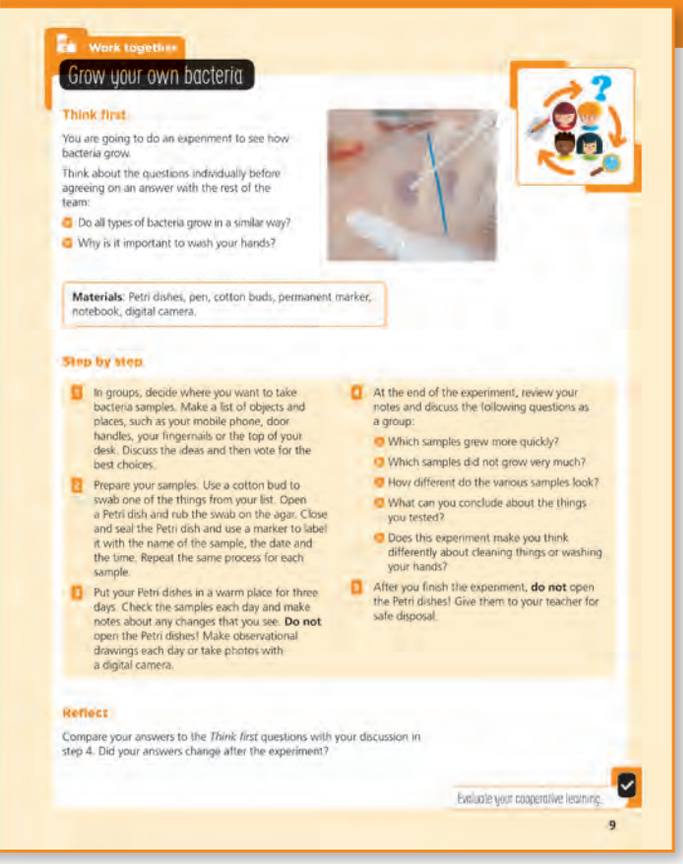
2 Are born, grow, interact, reproduce, die

3 Photosynthesis; Plants need energy to live and grow.

4 No, they aren't plants or animals. They belong to the Monera kingdom.

5 Model answers: *I think there is life on other planets. We could find water, soil and bacteria.*

WORK TOGETHER 9



Work together

Grow your own bacteria

Think first

You are going to do an experiment to see how bacteria grow.

Think about the questions individually before agreeing on an answer with the rest of the team:

- Do all types of bacteria grow in a similar way?
- Why is it important to wash your hands?

Materials: Petri dishes, pen, cotton buds, permanent marker, notebook, digital camera.

Step by step

1. In groups, decide where you want to take bacteria samples. Make a list of objects and places, such as your mobile phone, door handles, your fingernails or the top of your desk. Discuss the ideas and then vote for the best choices.
2. Prepare your samples. Use a cotton bud to swab one of the things from your list. Open a Petri dish and rub the swab on the agar. Close and seal the Petri dish and use a marker to label it with the name of the sample, the date and the time. Repeat the same process for each sample.
3. Put your Petri dishes in a warm place for three days. Check the samples each day and make notes about any changes that you see. **Do not** open the Petri dishes! Make observational drawings each day or take photos with a digital camera.
4. At the end of the experiment, review your notes and discuss the following questions as a group:
   - Which samples grew more quickly?
   - Which samples did not grow very much?
   - How different do the various samples look?
   - What can you conclude about the things you tested?
   - Does this experiment make you think differently about cleaning things or washing your hands?
5. After you finish the experiment, **do not** open the Petri dishes! Give them to your teacher for safe disposal.

Reflect

Compare your answers to the *Think first* questions with your discussion in step 4. Did your answers change after the experiment?

Evaluate your cooperative learning.

9

SUMMARY

Pupils will use the *Cooperative investigation* technique applied to an enquiry-based activity to encourage their curiosity about the world around them. First, pupils will discuss their ideas with a partner, then share them with the class, in order to form a class hypothesis. Next, they will agree on a plan and work in pairs to carry it out. With their partner, they will develop their conclusions and share them with the class. Finally, pupils will test their hypothesis by comparing their conclusion to their original hypothesis.

LANGUAGE

- Making suggestions: Let's take … We can take samples from … What about taking samples from … ?
- Making comparisons: This / That sample grew more / less quickly. These / Those samples didn't grow as much.

MATERIALS

Petri dishes, pen, cotton buds, permanent marker, notebook, digital camera.

GETTING STARTED

Ask pupils to describe what they see in the photo. Go through the list of materials, checking the groups have everything. Ask: *What do you know about bacteria? Are they harmful or beneficial?* Encourage a variety of responses and write pupils' answers on the board.

STEP BY STEP PAGE 9

- **Step 1.** Explain the importance of taking samples from different places, in order to collect a variety of bacteria for the experiment. Encourage pupils to think carefully and create a long list before voting.
- **Step 2.** Go through the instructions before pupils begin, so they do not contaminate the Petri dishes. Explain that they should not touch the agar with their fingers. Tell them to label the dishes right away to avoid confusion.
- **Step 3.** Ensure groups have stored their samples properly, and remind pupils to observe them and make notes every day.
- **Step 4.** Invite volunteers to present their findings.
  - Tell pupils that answers for questions a-d will vary. For question e, pupils should conclude that there are lots of bacteria growing on everyday objects, so they need to wash their hands regularly.

Model answers:

a. *The sample from … grew more quickly.*
b. *The samples from … did not grow as much.*
c. *These / Those samples are / aren't very similar.*
d. *The things that had the most bacteria were …*
e. *Yes. Some things are not very clean, so we must wash our hands after touching them.*

- **Step 5.** Explain that the bacteria have grown a lot and could now be dangerous. Explain to pupils how to dispose of biological waste safely.

WRAP IT UP

Encourage pupils to compare their current knowledge to what they thought before doing the experiment.

360° EVALUATION

Download, print and distribute the Cooperative learning evaluation for pupils to complete.

10 CHARACTERISTICS OF LIVING THINGS

SUMMARY

Pupils will learn that cells are the basic units of life that compose all living things, while differentiating between unicellular and multicellular organisms. They will also learn about the basic structures of plant and animal cells and how they differ from each other.

LANGUAGE

- Describing organisms: unicellular / multicellular organisms consists of one cell / many cells.
- Relative pronouns: *that* and *which*
- Verbs for cell functions: perform, carry out, enter, leave, fill, contain, grow, protect, etc.

MATERIALS

Flashcards: animal cell, multicellular organism, plant cell, unicellular organism.
Extra materials: two microscopes, slides of plant and animal cells, onion skin cells, cells from the inside of your cheek.

1.2 Characteristics of living things
1.3 Cell structure


Characteristics of living things

What were the first living things on Earth?

All living things consist of tiny units called **cells**.

- **Unicellular organisms** consist of only one cell. In unicellular organisms, the single cell performs all of the life processes.
- **Multicellular organisms** consist of many cells. In a multicellular organism, different cells carry out different functions.

Bluebirds are multicellular organisms.

Cell structure

A cell is the smallest living unit in a living thing. Plant and animal cells share the following features:

- **Nucleus:** It controls the functions of the cell, such as reproduction.
- **Cell membrane:** It controls the substances that enter and leave the cell.
- **Cytoplasm:** It is a jelly-like substance that fills the cell where chemical reactions happen.
- **Vacuoles:** They contain water and minerals, which the organism needs in order to grow. Not all animal cells have vacuoles.

Plant cells also have:

- **Cell wall:** It protects the cell and gives it its shape.
- **Chloroplasts:** They contain chlorophyll which is needed for photosynthesis.

1 Which organism can be more complex, a unicellular or a multicellular organism? Explain your answer.

2 Do animal cells have chloroplasts? Why or why not?

10

GETTING STARTED

Hold up your hand and ask what it is made of: *skin*, *bone*, *muscles*, *blood*. Ask what those things contain. *(Cells.)* Ask if there is any living thing smaller than a cell. *(No, the cell is the smallest unit of life.)*

STEP BY STEP PAGE 10

- Explain that the first living things on Earth were very simple, unicellular organisms. Ask pupils how we are different from those first single-cell organisms. Say: *We are multicellular because we have many cells.*
- Model and practise the pronunciation of new vocabulary: *nucleus*, *membrane*, *substances*, *cytoplasm*, *vacuoles*, *chloroplasts*, *chlorophyll*.
- Pupils read the text in pairs and look for verbs related to cell functions: *perform, contain, protect*, etc.

Activity 1

Pupils brainstorm unicellular and multicellular organisms. Ask: *What makes a living organism complex?* Pupils share their ideas.

Activity 2

Ask: *What is the main function of chloroplasts? (They absorb light during photosynthesis.)*

WRAP IT UP

If you have access to the school's science lab and equipment, set up two microscopes and samples of onion skin cells and cells from your cheek. Invite pupils to come up and observe the cells. Ask them to describe what they saw in each sample. Ask: *How are the samples different? (The onion cells are more rigid and geometric because they have a cell wall.)*

SOLUTIONS

1 A multicellular organism is more complex because it consists of many cells. The different cells carry out different functions.

2 Animal cells do not have chloroplasts or chlorophyll because they do not perform photosynthesis.

LIFE PROCESSES 11

Life processes

What conditions do plants need to grow?

All living organisms perform three **life processes: nutrition, reproduction** and **interaction**. Depending on the organism, these processes are carried out in different ways.

Nutrition

All living things take in **nutrients** from their environment to obtain **energy**. This energy allows them to grow and function properly.

Animals cannot produce their own food, so they feed on other living things.

Plants produce their own food through photosynthesis.

Decomposers, such as fungi and bacteria, feed on the remains of dead plants and animals.

Reproduction

This process allows living things to make new living things. Reproduction can be asexual or sexual.

- **Asexual reproduction** occurs when only one organism is required. It is common in unicellular organisms, such as bacteria.
- **Sexual reproduction** involves two individuals of the same species: a male and a female.

Interaction

Living things react to stimuli. **Stimuli** are changes in the environment. Any reaction of a living thing to stimuli is a **response**. Most plants do not have sensory organs like animals do, but they can also react to stimuli.

Useful language

Living things need energy to (grow) and ...
Plants can produce their own food.
(Fungi) feed on ...
What do (bacteria) feed on?

1 Name the three life processes. Are all three processes carried out in the same way?

2 What are stimuli? What is response? What stimuli do tulips respond to? Write your answers in your notebook.

3 Ask your partner. Why do living things need energy? How do different organisms get their nutrients?

11

SUMMARY

Pupils will learn that all cells perform three basic life processes: nutrition, reproduction and interaction. They will also learn how these life processes are carried out.

LANGUAGE

- Discussing ability: can / can't
- *Need* + object + infinitive: They need energy to grow.
- *Allow* + object + infinitive: It allows them to grow.

MATERIALS

Flashcards: chameleon, mushrooms.

- 1.4 Life processes
- 1.5 Nutrition
- 1.6 Reproduction
- 1.7 Interaction

GETTING STARTED

Pupils brainstorm names of different living things. Write their answers on the board. Ask: *How is it born? What does it eat? How does it move around?*

STEP BY STEP PAGE 11

- Read aloud the question box at the top of the page. Elicit: *soil*, *air*, *water*, *sunlight*. Ask: *What do people need to live?* (*Food*, *water*, *air*, *sleep*, etc.)
- Ask pupils to name one characteristic of each life process. Write their ideas on the board.

Activity 1

Ask: *Why do you think these processes are important?* Have a class discussion.

Activity 2

Ask: *What stimuli do you think (plants / animals / people) respond to?* Write pupils' answers on the board.

Activity 3

Ask: *Why is food necessary? How do you get energy? What happens if we don't eat?* Pupils make notes in pairs.

WRAP IT UP

Pupils look at the two cell illustrations on page 10. Ask them to name their main differences.

SOLUTIONS

1 Nutrition, reproduction, interaction; Depending on the organism, each process is carried out in a different way.

2 Stimuli: changes in the environment; response: reaction to stimuli; Tulips respond to sunlight.

3 Energy allows living things to grow and function properly. Animals feed on other living things. Plants produce their own energy through photosynthesis. Decomposers feed on dead organisms.

12 CELLS, TISSUES, ORGANS AND SYSTEMS

SUMMARY

Pupils will learn about the characteristics of specialised cells and how they function. They will also learn how cells form larger structures, which in turn form organs that function within systems. In this way, they will discover how cells can form complex organisms.

LANGUAGE

- Verbs for specific functions: carry (out), absorb, contain, protect, receive, form, perform, etc.
- Infinitive of purpose: Scientists use microscopes to observe cells. They work together to perform a function.

MATERIALS

Flashcards: leaf cells, nerve cells, red blood cells, white blood cells.
Extra materials: a microscope.


Cells, tissues, organs and systems

What instrument do scientists use to observe cells?

All plants and animals are multicellular, which means that they consist of many cells. Cells in most animals and plants are **specialised**. This means they carry out a particular function together and share the same life processes.

Specialised cells

These are some examples of specialised cells and their functions:

animal cells

Red blood cells carry oxygen around the body. They are red because they contain hemoglobin, a bright red protein that contains iron.

White blood cells protect the body from bacteria, viruses and other foreign invaders. They are like bodyguards.

Nerve cells carry information from the brain to the rest of our body. The brain also receives information from the sensory organs from these cells.

plant cells

Root hair cells absorb water and minerals from the soil.

Leaf cells absorb sunlight so photosynthesis can take place.

12

1.8 Cells, tissues, organs and systems
1.9 Specialised cells
1.10 From cells to organisms

GETTING STARTED

Play 'Simon says', using commands such as *jump, run in place, touch your (head).* Ask: *What holds up your body and allows you to move?* (*Bones and muscles.*) *What allows you to breathe in oxygen?* (*Lungs.*) *What transports the oxygen around your body?* (*Blood cells.*) Brainstorm more parts of the body and their functions.

STEP BY STEP PAGES 12–13

- Ask: *What equipment do you think scientists use to observe cells? (Microscopes.)* Ask: *What does a microscope do? (It magnifies tiny organisms so we can see them better.)* Explain that the photos show what certain cells look like under a powerful microscope. Volunteers describe what the cells look like.
- Explain new vocabulary, such as *haemoglobin*, *protein*, *bodyguards* and *root*. Model the pronunciation of any words that may be difficult for pupils.
- Ask pupils to describe what they see in the illustration. Ask: *What organ can you see in the last picture? What is its function?*

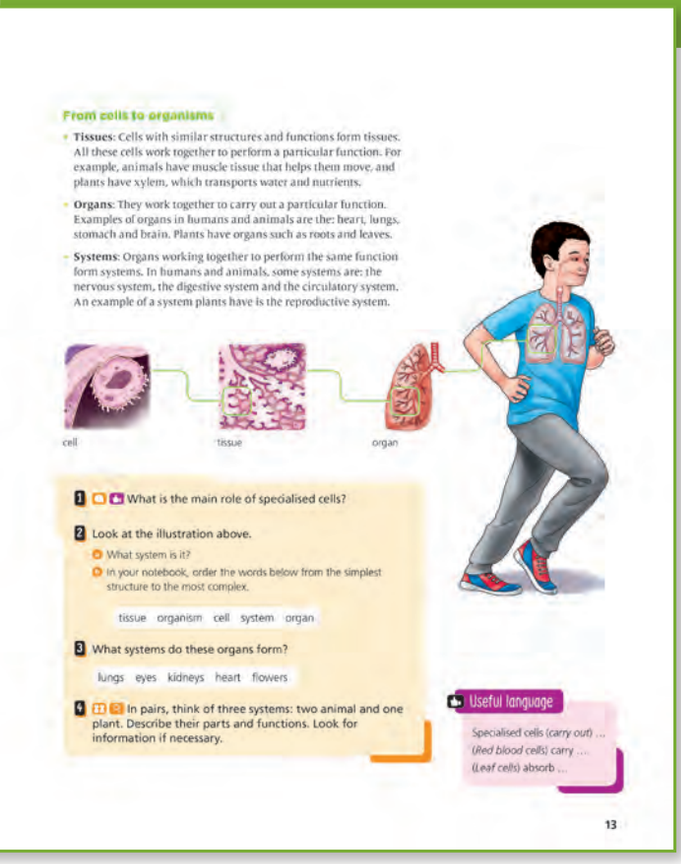
Activity 1

Pupils name some specialised cells. Ask: *Do they all carry out the same function?* This can be extended by asking: *What happens if people don't have enough iron in their diet?* (*They won't have enough iron to make haemoglobin.*) *What does your body produce when you have an infection?* (*More white blood cells.*)

Activity 2

- Ask: *Can you name the main systems in your body?* Write pupils' answers on the board. Then ask: *How are systems formed? (Organs form systems.)* Repeat with the words *organs* and *tissues*.
- Clap out the sentences rhythmically as a chant. Ask pupils to repeat and do this several times. Write the letters CTOSO on the board as a reminder of the order.

13



From cells to organisms

- **Tissues**: Cells with similar structures and functions form tissues. All these cells work together to perform a particular function. For example, animals have muscle tissue that helps them move, and plants have xylem, which transports water and nutrients.
- **Organs**: They work together to carry out a particular function. Examples of organs in humans and animals are the: heart, lungs, stomach and brain. Plants have organs such as roots and leaves.
- **Systems**: Organs working together to perform the same function form systems. In humans and animals, some systems are: the nervous system, the digestive system and the circulatory system. An example of a system plants have is the reproductive system.

cell tissue organ

1 What is the main role of specialised cells?

2 Look at the illustration above.
- What system is it?
- In your notebook, order the words below from the simplest structure to the most complex.

tissue organism cell system organ

3 What systems do these organs form?

lungs eyes kidneys heart flowers

4 In pairs, think of three systems: two animal and one plant. Describe their parts and functions. Look for information if necessary.

Useful language

Specialised cells (carry out) ...
(Red blood cells) carry ....
(Leaf cells) absorb ...

13

Activity 3

Ask: *What is the function of each organ? (Lungs help us breathe; Eyes allow us to see; Kidneys filter toxins from the blood*; *The heart pumps blood around the body; Flowers are responsible for the plant's fertilisation.)*

Activity 4

Say: *Think of two of your favourite animals. What are they? Do you have a favourite plant?* Invite pupils to makes notes individually before they pair up.

WRAP IT UP

Invite pupils to revise the texts on both pages. Ask them to find verbs and write them in their notebooks. Then a volunteer says a verb aloud (*absorb*). Another volunteer must then use the verb in a sentence about the topic: *Root cells absorb water and minerals*.

SOLUTIONS

1 Their main role is to carry out a specific function. For example, red blood cells carry oxygen. Nerve cells carry information. Leaf cells absorb sunlight.

2 a. the respiratory system

b. cell, tissue, organ, system, organism

3 Lungs, respiratory system; eyes, sensory system, kidneys, excretory system; heart, circulatory system; flowers, reproductive system.

4 Model answers:

- White Bengal Tiger: ears, sensory system; sharp hearing that helps tigers during their hunting activities.
- Cherry tree: roots, root system; Roots transport nutrients and water to the rest of the tree and help the tree anchor to the ground.

14 HOW LIVING THINGS ARE CLASSIFIED

SUMMARY

Pupils will learn about the five kingdoms of living things and the main characteristics of each kingdom. They will compare and contrast living things and discuss the importance of photosynthesis to plants. Pupils will also learn about viruses and yeasts.

LANGUAGE

- Regular and irregular plurals: virus / viruses, fungus / fungi, bacterium / bacteria
- Simple present passives: Living things can be classified. They can be found (on land). Viruses are not included.
- Comparing and contrasting: Plants have roots, but fungi do not. Plants can make their own food, but fungi cannot.

MATERIALS

Flashcards: amoeba, bacteria, chameleon, mushrooms, multicellular organism, unicellular organism.
Extra materials: flour, salt, water and a bowl.


How living things are classified

Are algae plants? How about mushrooms?

Living things can be classified into five groups called **kingdoms**. Organisms in the same kingdom share similarities and are different from organisms in other kingdoms.

Monera kingdom

This kingdom consists of primitive unicellular organisms. They can be found on land, in the air, in water and inside other living things. **Bacteria** belong to the Monera kingdom. We use some bacteria to make food, such as cheese and yoghurt. Some bacteria feed on dead plants and animals.

Close-up view of bacteria

Protist kingdom

Protists are usually unicellular, but some are multicellular. Most protists are aquatic.

Algae are protists and can be unicellular or multicellular. They make their own food through photosynthesis.

The **amoeba** is a unicellular protist. It takes in nutrients by absorbing them through the cell membrane.

Project tips

Which kingdom do insects belong to?

Fungus kingdom

Fungi can be unicellular or multicellular. They obtain the nutrients they need from the remains of dead plants and animals.

Yeasts are unicellular fungi. Yeasts can be found in soil and water, and on plants and animals.

Mushrooms are multicellular fungi. They are the fruiting body many fungi species have in common.

14

GETTING STARTED

Tell pupils that scientists classify living things into different groups by looking at their characteristics. This helps them distinguish how similar or different living things are to each other. Scientists can classify organisms according to their appearance, movement or reproduction.

STEP BY STEP PAGES 14-15

- Read aloud the question in the box at the top of the page. Encourage pupils to give a reason for their answers. Say: *Mushrooms are also called toadstools.* Ask: *Do you know what the largest and most complex algae are? (Marine algae.)*
- A volunteer reads aloud the first paragraph. Then write on the board the five main headings, which are the names of the five kingdoms. This will help pupils navigate the organisation of the text.
- Ask pupils what other things they know about the living things mentioned in the texts. Give some examples: *Algae live in water. Seaweed is a type of algae. Yeast is what makes bread rise. Some mushrooms are good to eat, while others are poisonous.*
- Volunteers read aloud the text about Whittaker's kingdoms. Model and practise any new vocabulary and pronunciation. Pupils complete the task in their notebook.
- **true:** b and c; **false:** a and d

Activity 1

- Pupils brainstorm characteristics of each kingdom. Ask: *Do any kingdoms share the same characteristics?*
- Remind the pupils that the Project tips box contains important information they will need for the Term 1 project.

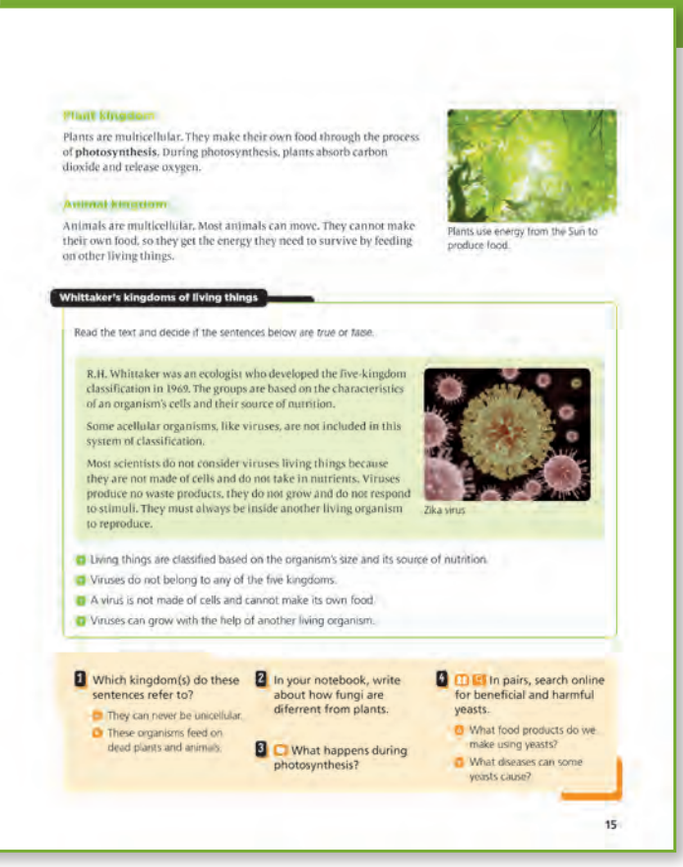
Activity 2

Pupils revise the texts about fungi and plants, making notes about their differences. Encourage them to add more facts. (*Fungi don't need sunlight to live and grow, but plants do. Fungi don't have roots. Fungi don't perform photosynthesis.)*

Activity 3

Ask: *What happens during photosynthesis? Why is photosynthesis so important for plants?* Pupils share their ideas.

15



Plant kingdom

Plants are multicellular. They make their own food through the process of **photosynthesis**. During photosynthesis, plants absorb carbon dioxide and release oxygen.

Animal kingdom

Animals are multicellular. Most animals can move. They cannot make their own food, so they get the energy they need to survive by feeding on other living things.

Plants use energy from the Sun to produce food.

Whittaker's kingdoms of living things

Read the text and decide if the sentences below are *true* or *false*.

R.H. Whittaker was an ecologist who developed the five-kingdom classification in 1969. The groups are based on the characteristics of an organism's cells and their source of nutrition.

Some acellular organisms, like viruses, are not included in this system of classification.

Most scientists do not consider viruses living things because they are not made of cells and do not take in nutrients. Viruses produce no waste products, they do not grow and do not respond to stimuli. They must always be inside another living organism to reproduce.

Zika virus

a. Living things are classified based on the organism's size and its source of nutrition.
b. Viruses do not belong to any of the five kingdoms.
c. A virus is not made of cells and cannot make its own food.
d. Viruses can grow with the help of another living organism.

1 Which kingdom(s) do these sentences refer to?
a. They can never be unicellular.
b. These organisms feed on dead plants and animals.

2 In your notebook, write about how fungi are different from plants.

3 What happens during photosynthesis?

4 In pairs, search online for beneficial and harmful yeasts.
a. What food products do we make using yeasts?
b. What diseases can some yeasts cause?

15

- 1.11 How living things are classified
- 1.12 Monera kingdom
- 1.13 Protist kingdom
- 1.14 Fungus kingdom
- 1.15 Plant kingdom
- 1.16 Animal kingdom

Activity 4

- Ask: *What is yeast? Where can we find it? Do you know any food made with yeast? (Bread.) Can you name any other of the ingredients we need to make bread? (Flour, water, salt.) Can yeasts be harmful? How? (Yes. They can affect our health.)*
- Brainstorm some keywords and write them on the board to help pupils with their research *(yeast science lesson / yeast food definition / yeast health benefits / yeast dangerous infection).* Remind pupils of tricks for an effective search.
- Pupils can divide the work, with one pupil looking for benefits while the other finds harmful effects. Pupils present their findings to the class in pairs.

WRAP IT UP

Tell pupils to invent two *odd one out* lists. Explain that for each list they have to write four organisms: three that belong to the same kingdom and one that belongs to another kingdom. When everyone has finished, they exchange lists with a partner and try to guess the odd ones out. They can repeat this with other partners.

SOLUTIONS

1 a. Plant and Animal kingdom; b. fungi

2 Some fungi are unicellular, such as yeasts. Fungi do not need sunlight to produce food. They cannot make their own food, so they feed on the remains of dead organisms. They do not perform photosynthesis. They do not have roots, stems, leaves or seeds.

3 Plants use sunlight to make their own food. During photosynthesis, they absorb carbon dioxide and release oxygen.

4 Model answers:

a. bread, cakes and pastries that rise; beer and wine
b. Athlete's foot is a common skin infection caused by yeast.

16 OUR WORLD

SUMMARY

Pupils will learn about life-changing advances in healthcare that have taken place in recent centuries. They will learn how these medical advancements have improved people's lives. They will also discuss how healthcare could be improved in developing countries.

LANGUAGE

- Healthcare vocabulary: vaccine, medicine, X-ray imaging, thermometer, illness, infection, antibacterial, disease, poisoning, pneumonia, etc.
- Describing changes: Science has changed people's lives. Life expectancy has improved.

MATERIALS

X-ray pictures of different body parts.

Our world

Life-changing inventions

Science has significantly changed people's lives over the last centuries. Nowadays, with advances in healthcare such as vaccines, medicines and high-tech medical equipment, life expectancy has improved considerably.

1 Get into pairs. Person A reads text A below. Person B reads text B on page 94. Together, decide if the sentences below refer to text A, B or both.

Unit 1, text A

Modern inventions in healthcare, such as X-ray imaging or the digital thermometer, have dramatically improved the quality of our lives.

All great scientific advancements can be traced back to the first microscopes built in the 16th and 17th centuries.

Nowadays, medical procedures are less invasive. It is also much easier to make diagnoses thanks to advances in areas like nuclear medicine. Clean water and sanitation have also contributed to saving many lives.

People today can live healthier, more productive and independent lives. Many individuals who may be disabled or suffer from a chronic illness can now lead normal or close to normal lives and build their self-esteem. Advances in healthcare play an important role in allowing people to live longer and to enjoy a better quality of life.

A CT scan or an MRI scan is how doctors examine the inside of our body.

a. All modern medical advancements can be traced back to this instrument.
b. Thanks to this discovery doctors can now treat infectious diseases.
c. Nowadays, medical procedures are less invasive.
d. Advancements in healthcare allow people to enjoy a better quality of life.
e. It became the world's first antibiotic.

2 Think of some resource-poor countries. Describe how medical breakthroughs could extend and improve people's lives. Consider the following health needs:

- safe water in schools and homes
- nutrition
- vaccines
- healthy eyesight and school performance

Useful language

Modern health inventions help people to (live longer).
Medicines like (penicillin) can help people to ...

16

GETTING STARTED

Write the following questions on the board and ask pupils to copy them into their notebooks: *What do you do when you feel ill? Have you ever broken any bones? How do doctors prevent or cure diseases?* Encourage a variety of responses.

STEP BY STEP PAGE 16

A volunteer reads aloud the introductory text. Ask: *What does life expectancy mean?* (*How long we can expect to live.)*

Activity 1

- Explain the task to pupils and invite them to read their assigned text. Model and practise any new vocabulary and pronunciation.
- Pupils work with a partner who reads text B. They can take turns guessing which of the sentences refer to each text. Encourage them to explain their reasons with reference to the texts.
- This can be extended by having pupils talk to another person who reads the same text and checks their understanding.

Activity 2

Tell pupils that developing countries have limited resources. Ask clarifying questions, such as *How could safe water improve people's lives? What about better nutrition?* Invite pupils to make notes and compare their ideas.

WRAP IT UP

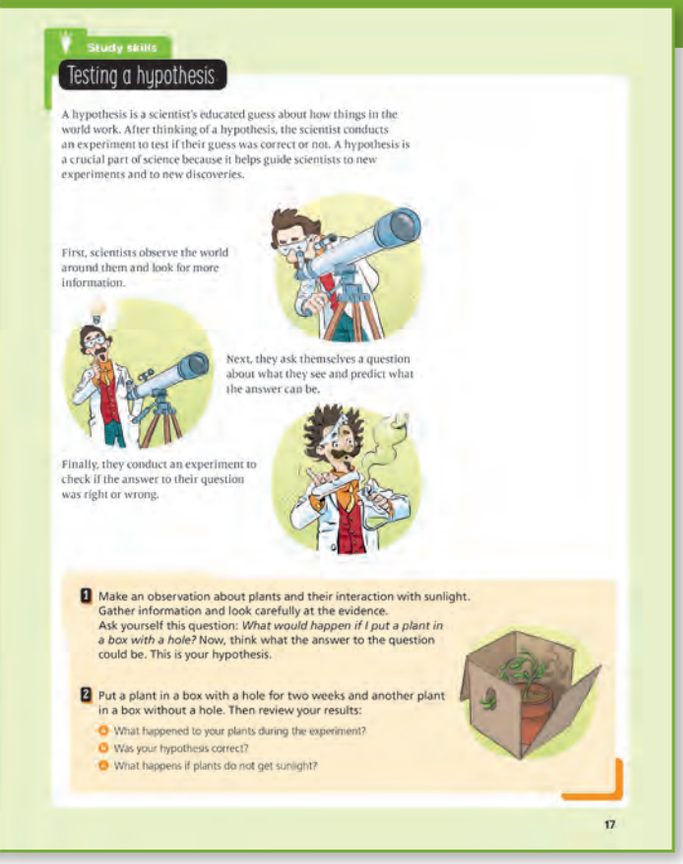
Ask pupils to revise both texts and make a list of adjectives in their notebooks: *high-tech, modern, digital, great, scientific*, etc. They can use them to write sentences about medical inventions.

SOLUTIONS

1 a. text A; b. text B; c. text A; d. both texts; e. text B

2 Model answer: Safe water helps to prevent disease. Good nutrition helps people to stay healthy. Vaccines protect us from diseases, like (flu). Children with healthy eyesight can do better at school.

STUDY SKILLS 17



Study skills

Testing a hypothesis

A hypothesis is a scientist's educated guess about how things in the world work. After thinking of a hypothesis, the scientist conducts an experiment to test if their guess was correct or not. A hypothesis is a crucial part of science because it helps guide scientists to new experiments and to new discoveries.

First, scientists observe the world around them and look for more information.

Next, they ask themselves a question about what they see and predict what the answer can be.

Finally, they conduct an experiment to check if the answer to their question was right or wrong.

1 Make an observation about plants and their interaction with sunlight. Gather information and look carefully at the evidence. Ask yourself this question: *What would happen if I put a plant in a box with a hole?* Now, think what the answer to the question could be. This is your hypothesis.

2 Put a plant in a box with a hole for two weeks and another plant in a box without a hole. Then review your results:

- What happened to your plants during the experiment?
- Was your hypothesis correct?
- What happens if plants do not get sunlight?

17

SUMMARY

Pupils will learn about scientific hypotheses and how they contribute to the scientific method. They will discover how a hypothesis is generated and tested experimentally. To consolidate their understanding of these concepts, pupils will formulate hypotheses about plants and their interaction with sunlight, and then conduct an experiment.

LANGUAGE

- Making predictions: What will happen if I put a plant in a box? I (don't) think it will grow.
- Sequence markers: First, we cut a hole. Next, we put a plant inside. Finally, we closed the box. Then we observed.

MATERIALS

Vinegar, bicarbonate of soda, a spoon, a glass, a potted plant, a cardboard box, scissors, water, digital camera.

GETTING STARTED

Show the pupils the vinegar and the bicarbonate of soda. Ask: *What do you think will happen if you mix the two ingredients together?* Write their ideas on the board. Explain that scientific guesses like this are called *hypotheses* and that the singular form is *hypothesis*. Then mix the bicarbonate and vinegar in the glass to demonstrate the results. Remind pupils that if they want to try this experiment at home, they should do it under adult supervision.

STEP BY STEP PAGE 17

Invite pupils to describe each illustration. Ask: *What is happening in the (first) picture?* Pupils share their ideas: *A scientist is looking into a telescope. He has an idea / makes a hypothesis. He does an experiment.*

Activity 1

- Ask: *How do plants interact with sunlight? (They use energy from the Sun to make their own food.)*
- Ask: *Have you ever tried to grow a plant? Did you succeed?* Then pupils discuss questions, such as *Will the plant (grow / die)? Will it grow towards or away from the light?* Explain that their answers are hypotheses. Write their ideas on the board.

Activity 2

Assign the task as homework and remind pupils that they must care for the plant and observe its progress. Tell pupils to take photos and make notes. After two weeks, pupils present their results and draw conclusions with the rest of the class.

WRAP IT UP

Ask: *What happens if you put water in the freezer?* Invite pupils to write a hypothesis, such as *If you put water in the freezer, it will freeze*. Then have pupils write hypotheses about more everyday things.

SOLUTIONS

1 Pupils' own answers.

2 a. It grew towards the hole and towards the light.
b. Pupils' own answers.
c. They do not grow and die.

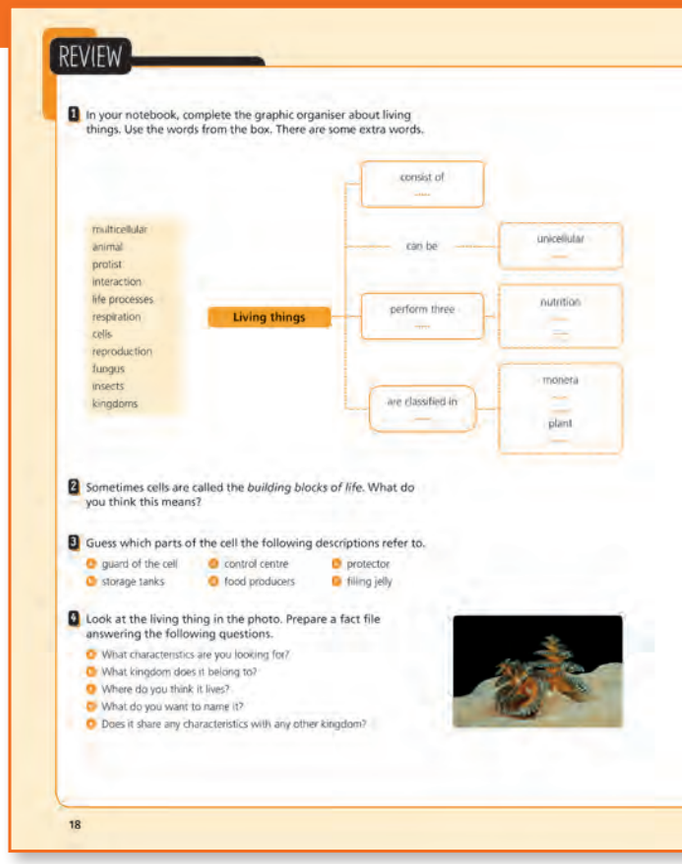
18 REVIEW

SUMMARY

Pupils review key concepts from the unit content and take an end-of-unit test.

LANGUAGE

- Describing living and non-living things: Marbles are non-living living things. Sunflowers grow. Bees reproduce.
- Describing organisms: Unicellular / Multicellular organisms consist of one cell / many cells.
- Comparing and contrasting: Plants have roots, but fungi do not. Plants can make their own food, but fungi cannot.
- Describing changes: Science has changed people's lives. Life expectancy has improved.
- Making predictions: What will happen if I put a plant in a box? I (don't) think it will grow.


REVIEW

1 In your notebook, complete the graphic organiser about living things. Use the words from the box. There are some extra words.

multicellular
animal
protist
interaction
life processes
respiration
cells
reproduction
fungus
insects
kingdoms

Living things

consist of ____
can be ____ unicellular
perform three ____ nutrition
are classified in ____ monera, plant

2 Sometimes cells are called the *building blocks of life*. What do you think this means?

3 Guess which parts of the cell the following descriptions refer to.
guard of the cell · control centre · protector · storage tanks · food producers · filling jelly

4 Look at the living thing in the photo. Prepare a fact file answering the following questions.
What characteristics are you looking for?
What kingdom does it belong to?
Where do you think it lives?
What do you want to name it?
Does it share any characteristics with any other kingdom?

18

GETTING STARTED

Invite pupils to look back through the unit and think about which lessons they found easy, difficult or interesting.

STEP BY STEP PAGES 18-19

Activity 1

- Remind pupils that when we organise new information it is easier to understand and remember it.
- from left to right: cells, multicellular, life processes, interaction, reproduction, kingdoms, protist, fungi, animal.

Activity 2

- Ask pupils if they have ever played with LEGO. Explain that they are building blocks. Then ask why they are comparable to cells.
- They are the basic units that compose all living things.

Activity 3

- Explain that other parts of cells can also be compared to objects, such as those in the list. Allow pupils time to guess on their own or in small groups.
- a. membrane; b. vacuoles; c. nucleus; d. chloroplasts; e. cell wall; f. cytoplasm

Activity 4

- Explain that a fact file is a description that includes key information, often in point form. Call attention to the keywords that would be headings: *characteristics, kingdom, home / habitat, name,* etc.
- Pupils' own answers.

Activity 5

- Go through the list of words and invite pupils to give a brief definition for each. Remind pupils that they need to read all of the sentences before completing the task.
- a. cells; b. multicellular; c. nucleus; d. specialised

Activity 6

a. basic unit of life; b. a collection of specialised cells; c. a collection of tissues; d. a group of organs

Activity 7

- In pairs, pupils share what they have learned about the different kingdoms.
- a. do not take; b. Protist; c. Animals cannot; d. Some yeasts are aquatic. All yeasts are unicellular.

19

5 In your notebook, complete the sentences by choosing the right words from the box. There are some extra words.

specialised • nucleus • cytoplasm
microscope • cells • multicellular

- The small units that make up living things are called ...
- Organisms made up of many cells are called ... organisms.
- The ... controls the functions of the cell.
- Cells in most animals and plants are ...

6 In your notebook, define the following words and give an example of each.

- a cell
- a tissue
- an organ
- a system

7 Correct the sentences in your notebook.

- Fungi take in nutrients through photosynthesis.
- Algae belong to the Monera kingdom.
- Some animals can make their own food.
- Yeasts are aquatic, multicellular fungi.

8 Read the sentences below. Which part of a cell do they refer to?

- They contain chlorophyll and only plant cells have them.
- It controls what enters and leaves the cell.
- It controls all the functions of the cell.
- Most chemical reactions take place here.
- They give plant cells their shape.

9 Look at the photos below. Which life processes are they related to? Give three reasons why these functions are important.

Puppies with their mum

Squirrel eating a strawberry

10 Why do you think a butterfly is a living thing while a rock is not? Give at least two reasons.

11 Both bacteria and animals consist of cells. What is the main difference between them? Do they have anything in common?

12 Talk about the Animal kingdom. Then describe your favourite animal. Use the word cloud below to help you.

move
reproduce
multicellular
respond to stimuli
omnivore

What do you know now? Check your progress!

19

Activity 8

- Volunteers share what they know about cell structure. Write their answers on the board.
- a. chloroplasts; b. membrane; c. nucleus; d. cytoplasm; e. cell wall

Activity 9

- Ask: *Can you name the three main life processes? Why are they important to living things?*
- puppies: reproduction and nutrition; squirrel: nutrition and interaction

Activity 10

- Ask: *What life processes does a butterfly perform? And a rock?* Elicit: *Butterflies perform nutrition, reproduction and interaction. Rocks do not.*
- A butterfly is born, grows, reproduces and dies. It performs all three main life processes.

Activity 11

- Ask: *What tool do we need to see bacteria? Where do they live?*
- Bacteria are unicellular. Both animals and bacteria are living things. Neither can make their own food.

Activity 12

- Tell pupils to make notes about what they want to say. Pupils can then circulate and talk to several people, describing the animal they have chosen.
- Model answer:

  My favourite animal is the White Bengal tiger. It is a multicellular organism. It is not an omnivore. It is a carnivore. It feeds on other animals. It responds to stimuli, like light and sounds. It moves very quickly. It reproduces by having babies.

WRAP IT UP

Encourage pupils to note which activities they found more difficult and then dedicate more study time to those parts of the unit before the test.

360° EVALUATION

Download, print and distribute the end-of-unit test. Compare the test at the end of the unit with the ones the pupils did at the beginning and during the unit. Ask: *What did you learn?* Elicit vocabulary and concepts for the unit.

UNIT 1 DIAGNOSTIC TEST

Name: _____

Class: _____

1 Circle the odd one out.

a	mushroom	monkey	lion	snake
b	tree	bacteria	grass	flower
c	seahorse	sunflower	butterfly	rock
d	apple	spider	water	octopus
e	snake	bird	cactus	jellyfish

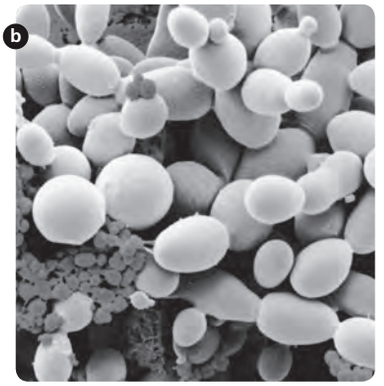
2 What life process do these living organisms perform? Explain your answer.

a 

_____

_____

_____

b 

_____

_____

_____

c 

_____

_____

_____

3 Match the definitions to the words.

a. the process plants use to make food

b. cheese and yoghurt are foods produced by these microorganisms

c. a living thing

d. the smallest living unit in living things

e. a change in the environment

1. cell

2. organism

3. stimulus

4. photosynthesis

5. bacteria

UNIT 1 PUPIL'S SELF-EVALUATION

Name: _____

Class: _____

1 What do you know about living things? Tick.

	I'm an expert!	**I know some things, but I have some questions.**	**I have lots of questions!**
Characteristics of living things: describe the cell structure			
Life processes: explain how nutrition, reproduction and interaction are carried out			
Cells, tissues, organs and systems: name the different functions of specialised cells			
From cells to organisms: how organs are formed			
How living things are classified: identify the five kingdoms			

UNIT 1 COOPERATIVE LEARNING EVALUATION

Name: _____

Class: _____

1 Evaluate your cooperative learning. Tick.

Self-evaluation

	Great work!	Good job!	I can do better next time!
I worked well with my group.			
I waited my turn to speak.			
I listened to the rest of the group members.			
I asked for help when I needed it.			

Group evaluation

	Great work!	Good job!	We can do better next time!
We all contributed to the project.			
We shared our ideas and listened to each other.			
We respected each other's opinions.			
We finished our task on time.			
We all helped to prepare the presentation.			
We solved any problems we had effectively.			
We all enjoyed working together.			

UNIT 1 END-OF-UNIT TEST

Name: _____

Class: _____

1 Circle the correct words to complete the sentences.

a. Taking in food to obtain energy is called *nutrition* / *growth*.

b. *Plants* / *Decomposers* can make their own food.

c. *Respiration* / *Reproduction* means making new living things.

d. Only one organism is required in *sexual* / *asexual* reproduction.

e. Responding to changes in the environment is called *movement* / *interaction*.

2 Which life process do these actions show?

action	function
a. A plant grows in the direction of sunlight.	_____
b. A fungus feeds on a dead tree trunk.	_____
c. A male and a female zebra produce a baby zebra.	_____
d. A bacterium divides into two.	_____

3 Label the plant cell.

1. c_____

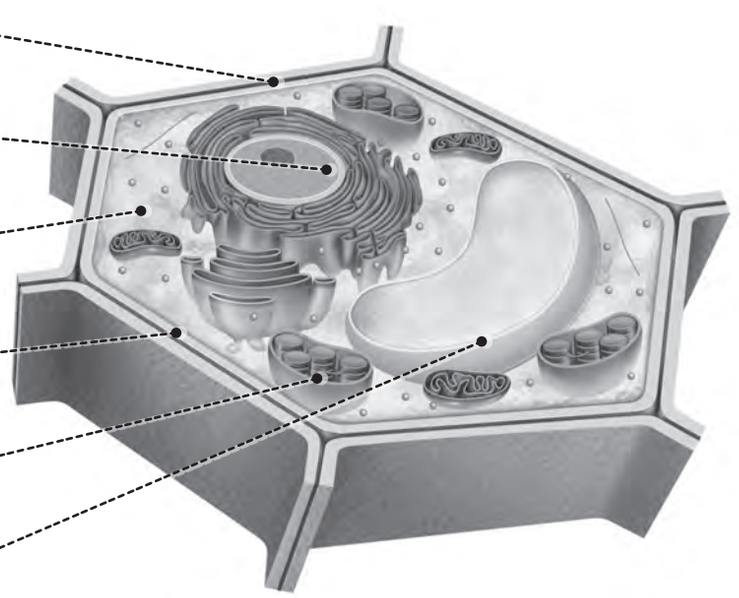
2. n_____

3. c_____

4. c_____

5. c_____

6. v_____



4 List the features that are common to plant cells and animal cells.

_____

5 Complete the text with words from Activity 3.

The (1) _____ controls all the functions of the cell. The cell is protected by a 'skin' which is called the (2) _____ . Plant cells also have a hard _____ which gives the cell its shape.
The cell is filled with a jelly-like substance called (4) _____.
Plant cells and most animal cells have (5) _____ which contain water and minerals but only plant cells have (6) _____.
They use these for photosynthesis.

6 Match the kingdom to the organism.

a. Plant kingdom	**1.** yeast
b. Animal kingdom	**2.** tree
c. Protist kingdom	**3.** bacteria
d. Fungus kingdom	**4.** algae
e. Monera kingdom	**5.** starfish

7 Which kingdoms are ...

a multicellular? _____

b unicellular? _____

c both? _____

8 Look at the pictures and identify the kingdoms.

a 

b 

c 

d 

_____ _____ _____ _____

_____ _____ _____ _____

UNIT 1 EVALUATION GRID

Name: _____

Class: _____

Pupils	Describe living things and their main characteristics.	Identify the main life processes of living things.	Describe the structure of plant and animal cells.	Identify specialised plant and animal cells and their functions; describe how cells form tissues, tissues form organs and organs form systems.	Know the different groups living things belong to, describing their main characteristics.

UNIT 1 LETTER HOME

Dear Parent / Carer,

In this unit, your child will begin by looking at the photos related to living things, the unit topic, on the first two pages. These photos will act as a tool to help the pupils brainstorm ideas and opinions on the subject matter and to assess their previous knowledge. Your child will then revise and reinforce previous knowledge in the *Reflect* section. This section is designed to build pupils' confidence about what they already know and prepare them for the unit subject matter.

After the *Reflect* activities, your child will move on to the *Work together* section in which they will use a cooperative learning technique to carry out a group experiment. Pupils will do an experiment to learn how bacteria grow, while also developing important teamwork and communication skills.

This unit on living things will expand on your child's previous knowledge of plants, animals and other life forms. This will include the three main life processes carried out by living things. Your child will learn the structure of plant and animal cells, and how cells organise to form tissues, organs and systems. To better understand how scientists group living things, pupils will read about the five kingdoms and identify their main characteristics. Finally, the *Our world* section will encourage your child to reflect on the contributions of scientific inventions and how they have improved our quality of life.

Useful language tips throughout the unit will provide language support to your child as they talk about the unit content.

KEY VOCABULARY

- Unicellular, multicellular
- Nutrition, reproduction, interaction
- Cells, tissues, organs, systems
- Monera, Protist, Fungus, Plant and Animal kingdoms

Have fun!

Best wishes,

Science teacher

Notes


NATURAL
SCIENCE
LEARN TOGETHER