



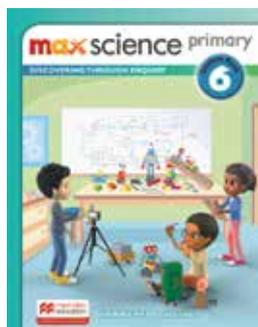
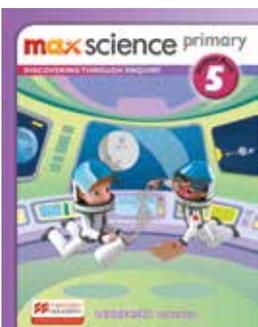
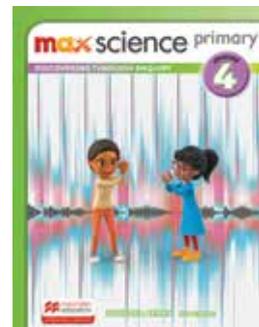
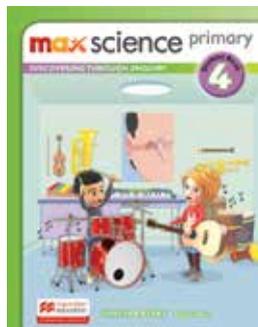
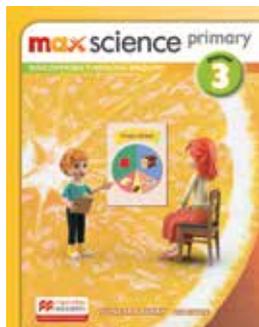
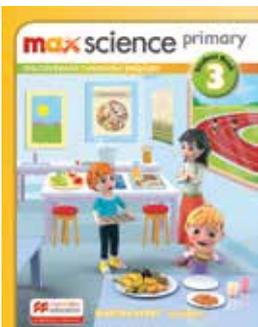
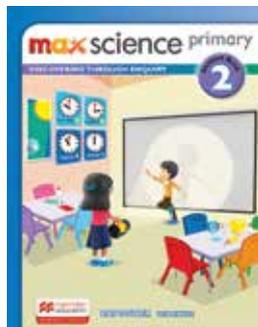
Unlock the power of learning science in English



# max science primary

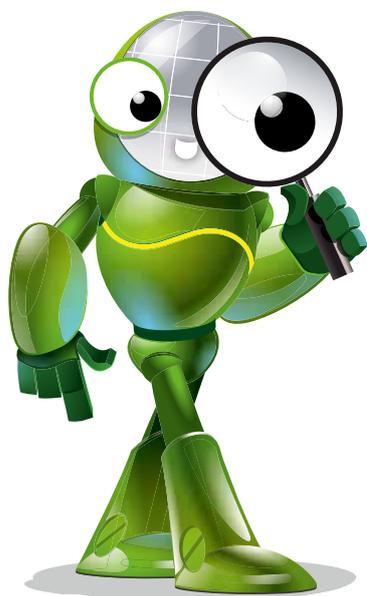
DISCOVERING THROUGH ENQUIRY

PRIMARY • YEARS 1 – 6



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*"The Max Science primary: Discovering through Enquiry learning materials have been written by a skilled group of international science educators who have been guided by best practice in modern science pedagogy. Our guiding philosophy has been to design a course enabling a deeper understanding of science, building confidence in key conceptual areas through a set of thinking, talking and practical tasks where learners work together, are encouraged to share their own thinking and are aware of their own progress in the journey towards understanding. All our supporting text has been written with particular sensitivity and guidance for students whose first language may not be English."*

**Bob Kibble, Series Editor**



## The DNA of Max Science primary

**Max Science primary: Discovering through Enquiry** is a highly engaging and effective print and digital scheme based on the most successful teaching methodologies used in world science today. Over 6 stages (Years 1 – 6) Max Science primary introduces pupils to the key concepts and topics of primary Biology, Chemistry and Physics with carefully scaffolded resources that build knowledge and confidence throughout the course. The materials take the form of engaging Student Books, Workbooks, Journals and Teacher's Guides. The aim? To encourage curiosity, critical thinking and discussion through a vibrant and stimulating approach to science.



## Dissecting Max Science primary

All the content has been written by a highly experienced and knowledgeable author team who share a philosophy of learning grounded in science education research and best practice.

- For Years 1-6, divided into six units of work per year/two units per term
- Supports the development of key scientific skills such as enquiry based learning and critical thinking
- Language support for teachers and learners whose first language may not be English
- Is part of the Macmillan Education International Curriculum 'Promise', meaning that the course includes ongoing assessment, school-home journals, digital resources, tools for independent learning and professional development support for teachers
- 100% match to the Cambridge Primary Science Curriculum Framework



PART OF THE **INTO** GROUP

### Teaching through English: Primary Science Training

The Teaching through English: Primary Science teacher development programme has been designed in conjunction with NILE to support primary maths and science teachers with a specific focus on supporting international and English-medium schools where teachers and learners may not have English as their first language. The course aims to develop teachers' confidence and skills in supporting young learners to understand and apply scientific ideas and concepts in English.



# The Science behind the Science

Max Science: Discovering through Enquiry is underpinned by four concepts grounded in science education research and best practice.

The four concepts are:

<p><b>Social Constructivism</b></p>	<p>Encouraging the conceptual understanding of really big ideas.</p> <p>Recognising that students will have already formed ideas about why things happen.</p> <p>Listening to one another's ideas.</p> <p>Sharing knowledge.</p> <p>Thinking creatively and working out new and better explanations.</p>
<p><b>Formative Assessment</b></p>	<p>Used throughout lessons and topics.</p> <p>Feedback helps learners know how to improve. Uses many methods to assess what learners know, understand and can do e.g. listening to what learners say, looking at drawings, watching learners during activities.</p> <p>Often interactive between learner and teacher e.g. "what do you think if..."</p> <p>Can be very open-ended, meaning learners can go into lots of extra detail.</p> <p>Can have a huge benefit to learning – not just in science!</p>
<p><b>Cognitive Acceleration</b></p>	<p>Making neural connections and understanding ideas and concepts, which lead to the 'aha' moment.</p> <p>Getting learners to think rather than just learn information.</p> <p>Sharply focuses on a particular skill or concept.</p> <p>Uses exploration, discussion and challenges. Scaffolds learning so that learners can make rapid progress e.g. provide key words for learners to use when they explain a scientific idea.</p> <p>Provides cognitive conflict e.g. learners believe that plants need sunlight so how do some plants grow under trees in a forest?</p>
<p><b>The nature of science (scientific enquiry)</b></p>	<p>Science is just as much a way of working as a body of knowledge.</p> <p>Scientific understanding is based on a collection of <b>big ideas</b>.</p> <p>Scientific knowledge and understanding is just our best current explanation of the universe and everything in it.</p>



# The Teaching Approach

Lessons are structured around three main components – orientation, exploration and accommodation - to ensure that the time in the classroom is one that is inspiring, accessible and engaging.

- **Orientation:** The ‘why’ behind activities. This phase gives direction to our learning journey by activating and then building on prior knowledge. What is being found out? Why is it important?
- **Exploration:** The ‘hands-on’ aspect of the lesson. Exploring, experimenting, investigating and finding out.
- **Accommodation:** The review. A consolidation of the lesson through the acts of explaining and discussing, writing of notes and a questioning of what has been learnt.

## ORIENTATION

- What sort of learning does this orientation task encourage?
- What will learners be doing?
- What might they be saying?

## 6.2 Where do plants come from?

**In this section, I am learning:**

- what seeds and plants need to grow
- to make a prediction

**Key words**  
grow  
predict  
seed  
water

**Look at Picture A. Talk about what is happening in your group.**

**Now look at Picture B. Can you predict how the plant got there? Why did it grow? Why are there no other plants there?**




Picture A Picture B

6 Growing Plants 85

## EXPLORATION

- Guided group activity
- Clear structure
- Short, simple task

## SCAFFOLDING

Illustration and hint to support learning.

## DISCURSIVE ACTIVITY

- Clear images
- Shared ideas
- Formative assessment to close.

## ACCOMMODATION

Directs learners to workbook task for this activity.

### 3 Investigating reflection

Work in small groups.  
a. You will need a ray box and a mirror. With the room lights dimmed, learn how to make a single beam of light using the ray box.  
b. Direct the single beam to a mirror standing in a holder. The mirror should be vertical. Observe what happens to the beam.



**Hint**  
Don't forget to put arrows on the light rays you draw to show their direction.

### Some uses of mirrors



1



2



3



4

#### 4 How we can use mirrors

a. Talk with a partner about how the mirrors in each of these photos above are used.  
b. Write a sentence explaining how we use each of these mirrors or draw a diagram showing light rays to help explain each use.

WB

## Investigating the effect of temperature

### 5 How does temperature affect how quickly sugar dissolves?

In your Workbook, record each stage in your investigation as you work through it. Look back to the diagram on the previous page to help you make decisions yourself.

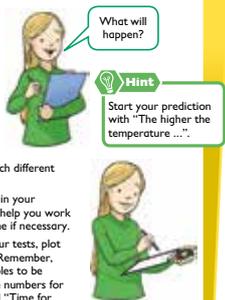
#### a) Predicting

Predict the pattern you expect to find.

#### b) Carrying out and recording

Now start your tests. Repeat them three times with each different temperature if you have time.

- Record your results in a table in your Workbook. Your teacher will help you work out the average (or mean) time if necessary.
- When you have finished all your tests, plot your results on a line graph. (Remember, a line graph needs both variables to be measured – and here we have numbers for both “Temperature in °C” and “Time for sugar to dissolve (in seconds)”.)



What will happen?

**Hint**  
Start your prediction with “The higher the temperature ...”.

WB

## INVESTIGATING

- Planning
- Predicting
- Measuring
- Interpreting



# Student Books

## Student Books 1 – 6

Print and Digital formats available

Written and designed by leading science educators, these books form the basis for active, enquiry-based classroom learning. They are in full colour throughout and match the requirements for the Cambridge Primary Science curriculum framework. Each topic is introduced through engaging activities designed to stimulate creative scientific thinking. Whole class teaching is focused on firmly embedding the concepts through active individual, pair and group activities and carefully scaffolded learning. Units end with checklists and consolidation sections to ensure learners understand the key concepts.



# 1 Skeleton and muscles

**In this unit, I am learning:**

- that our skeleton is made up of bones
- about the main jobs of the skeleton
- how the skeleton grows and moves
- how muscles and bones work together for movement
- about the role of drugs as medicines
- that there are different types of skeleton.

**Key-words**  
 animal  
 contract  
 fracture  
 invertebrate  
 muscles  
 relax  
 skeleton  
 vertebrae  
 X-ray

**What are the children doing? What helps them to move their bodies? How do they keep their bodies upright?**



6

Student Book 4

# 1.1 Skeletons

**In this section, I am learning:**

- that bones form our skeleton
- about X-ray images.

**Key-words**  
 animal  
 discuss  
 fracture  
 skeleton  
 X-ray  
 bones  
 fingers  
 human  
 vertebrate

**What can the children find out from looking at these old bones?**

**Skeletons can tell us secrets**  
 Many animals have bones inside their bodies. Animals with bones inside their bodies are called **vertebrates**. The **bones** form a **skeleton**. Bones are hard. They exist for a long time after an animal has died.

Dinosaurs lived millions of years ago. No one has ever seen a living dinosaur. Scientists called **palaeontologists** look at dinosaur bones to get an idea of what these animals looked like.

**Hint**  
 Think about how dinosaurs moved. What do you think they ate? How did they fight?

**1 Drawing the dinosaurs**

- Look at the picture of a dinosaur skeleton. Imagine what the dinosaurs looked like in real life. **Discuss** your ideas with your partner.
- Draw a picture in your Workbook.



**WB 1**

I wonder what this animal looked like when it was alive.  
 Maybe we can join all the bones together to make a skeleton.

1 Skeleton and muscles 7

Student Book 4

# 2 Reversible and irreversible changes

**In this unit, I am learning:**

- how to distinguish between reversible and irreversible changes
- about dissolving and making solutions
- how to separate different mixtures by filtration and/or evaporation

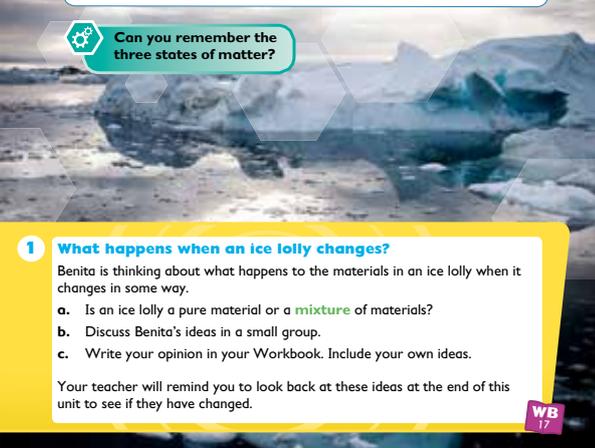
**Key-words**  
 change  
 mixture

**Can you remember the three states of matter?**

**1 What happens when an ice lolly changes?**  
 Benita is thinking about what happens to the materials in an ice lolly when it changes in some way.

- Is an ice lolly a pure material or a **mixture** of materials?
- Discuss Benita's ideas in a small group.
- Write your opinion in your Workbook. Include your own ideas.

Your teacher will remind you to look back at these ideas at the end of this unit to see if they have changed.



**WB 17**

25

Student Book 6

**4 Examples of reversible changes**

Look at these examples of reversible changes in action. Work with a partner. Answer these questions in your Workbook.

**A** Why can cars not drive on a new tarmac road for a couple of days?  
 Laying a new road with hot, sticky tarmac

**B** Which material is changing state when we defrost a frozen meal? Name the change of state taking place. If you turn the microwave oven on too high, what will you see coming out of the oven when you open its door? Explain why. What will happen to this material when it meets a cold surface?  
 Defrosting (not cooking) a frozen meal

**C** Describe the changes of state when you ice a cake using a bar of chocolate to start with. What do icing the cake with chocolate and making gold rings have in common? How are they different?  
 Using chocolate to ice a cake

**D** Making gold rings

**Hint**  
 Think of the temperature of each material as it changes.

**WB 20**

30 2 Reversible and irreversible changes

Student Book 6



# Journals

## Journals 1 – 6

The Journals provide a unique way to engage parents in their child's learning as well as providing the opportunity to consolidate their classroom learning at home through reflective practice. They are packed full of engaging practical activities that not only back up the scientific concepts introduced in the classroom but also show how science is all around us all the time.

### Introducing the Max Science Primary Journal

The **Max Science primary Journal** complements the **Max Science primary** series by providing a link between learning at school and learning at home. It matches the topics from the course and the Cambridge Primary Science Curriculum framework with a topic-by-topic series of structured activities for learners to complete with an adult.

As a parent or carer, it is sometimes difficult to know what is being taught in school and how your child is really doing in a subject. Do they enjoy it? Do they understand the concepts and the vocabulary? This Journal lets you spend time with your learner at home in a supportive way and find out how they are doing in science.

#### Introducing the topic

A cartoon image and question introduces every science topic in a fun and engaging way.

#### 1 Our bodies

##### 1.1 The human body

###### Some things are the same, some things are different

Heads are not exactly the same to one another either. We have differences that allow us to tell one another apart.

Look at the cartoon.

Both children have a head. What other things do you see that are the same?

#### Practising my science language

Try to key sentences using some of the science words from this topic:

**making sentences**

light dark hot cold dry damp

For example: "Plants like to live in light places."

Write your sentences on lines:

In a sunny place it is \_\_\_\_\_

In a dark place it is \_\_\_\_\_

By a river it is \_\_\_\_\_

#### Practising my science language

This feature provides language practice of key words to improve scientific vocabulary and to make it easier to learn science in English.

#### Check my science

Each topic allows learners to check their understanding through this activity.

##### Check your science!

###### Using your senses

You can use different senses to recognise an object, such as the guitar in the picture.

You can tell it is a guitar and not a different object.

You can see its shape. You can hear the sound it makes. You can feel its shape.

What senses do **you** help you to tell that it is a guitar?



#### From school to home

Ask an adult at home to help you --

1 Talk to someone at home about what you know of the topic.

2 Now ask someone at home to help you complete the following questions:

a. What did you like about this topic?

b. Which was hard to understand about this topic?

#### From school to home

You can work together at home to complete this section at the end of each topic. The Journal can then be taken into school for the teacher to look at and discuss, and acts as a record of the learners' progress.

I understand.



I understand a bit.



I need more time to understand this.

3

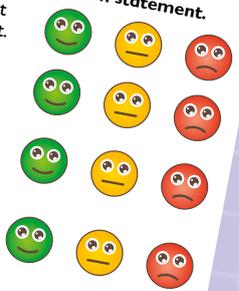
Look again at the checklist below. How are you doing now? Circle one face for each statement.

I can name things that give off their own light.

I know some objects only pass on light from elsewhere.

I can describe what "dark" means.

I can describe the difference between light, dim light and darkness.



Ask an adult at home to read and sign this.

We have shared some understanding at home.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Teacher comment: \_\_\_\_\_

Date: \_\_\_\_\_



# 1 Ourselves

## 1.1 The human body

### Some things the same, some things different

Humans are not exactly the same as one another. We have differences that allow us to tell one another apart.

Look at the cartoon.

Both children have a head.

What other things can you see that are the same?



One child is taller than the other.

What other things can you see that are different?

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1

Journal Book 1

# 1 Light and dark

## 1.1 Where light comes from

Some objects give off their own light. The Sun gives off its own light. Other objects only pass on light from elsewhere. They do not give off their own light.

I think the torch is making its own light.



I think the mirror is making its own light too.

Do you think Omar and Atiya are both right?

Choose one of the options in each sentence. Then give a reason for your answer.

I think Omar is right / is not right because \_\_\_\_\_

\_\_\_\_\_

I think Atiya is right / is not right because \_\_\_\_\_

\_\_\_\_\_

1

Journal Book 2

# 4 Investigating plant growth

## 4.1 Investigating germination

In Topic 4.1, you should be able to investigate the conditions that are needed for seeds to germinate.

This will include predicting, planning, carrying out and evaluating your own investigation.

The seeds inside this packet are in the dark, so they cannot germinate before I'm ready to plant them in the garden.



Picture 1

I'll leave the packet out in the garden until I get time to plant them. I know the packet is made of paper, but it won't matter if the seeds get wet.



Picture 2

1. Look at picture 1. What do you think of Malik's dad's idea about seeds in the dark? Explain your answer.

\_\_\_\_\_

2. Look at picture 2. What do you think of Malik's dad's idea about seeds and water? Explain your answer.

\_\_\_\_\_

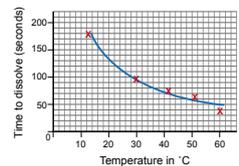
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Journal Book 5

## Practising my science language

1. A group investigated how the temperature of water affected the time it took sugar to dissolve.

Look at this line graph of their results:



a. Use the graph to answer this question. How long did the sugar take to dissolve at 30 °C? \_\_\_\_\_ seconds

b. If the temperature is low, what happens to the time it takes the sugar to dissolve? Finish the sentence.

When the temperature is low, \_\_\_\_\_

c. If the temperature is high, what happens to the time it takes the sugar to dissolve? Finish the sentence.

When the temperature is high, \_\_\_\_\_

d. How does the time it takes sugar to dissolve depend on the temperature? Complete the pattern.

The higher the temperature, \_\_\_\_\_

e. The whole class were doing the same investigation. The teacher noticed that another group tested sugar grains at three different temperatures and a sugar cube at another two different temperatures. What did this group do wrong? Complete the sentence.

The group should have \_\_\_\_\_

50

2 Reversible and irreversible changes

Journal Book 6



# Introducing the *Max Science* primary Workbook

The *Max Science primary Workbooks* accompany the **Student Book** for class and home use. All the numbered activities and extension activities found in the Student Book are expanded with clear answer spaces and support. Instructions carefully show if activities are to be done independently, in pairs or in groups.

## Practising my science language

Supported activities focus on improving scientific literacy to make the learning of science through the medium of English more accessible.

## Extending understanding

Extension questions encourage learners to go a bit further to improve the depth of understanding.

**1.2 Parts of the human body**

**Practising my science language**

**1 The body song**

Name of body part	Number of times it is named
head	

How many body parts are named in the body song?

**2 Draw and label the body**

Work in a group. One person lies down on a large sheet of paper. Draw around the person. Now copy the outline you drew here. Label three body parts. Use these words.

head hand leg

**1.2 Parts of the human body**

**Extension**

Look at the picture. Why is the toy a non-living thing?  
I think it is a non-living thing because it

**Checklist**

Read each sentence and circle a face for it. Like this:

- I can say if something is alive.
- I know the differences between living and non-living things.
- I can name some living and non-living things.

I understand.

I understand a bit.

I need more help to understand this.

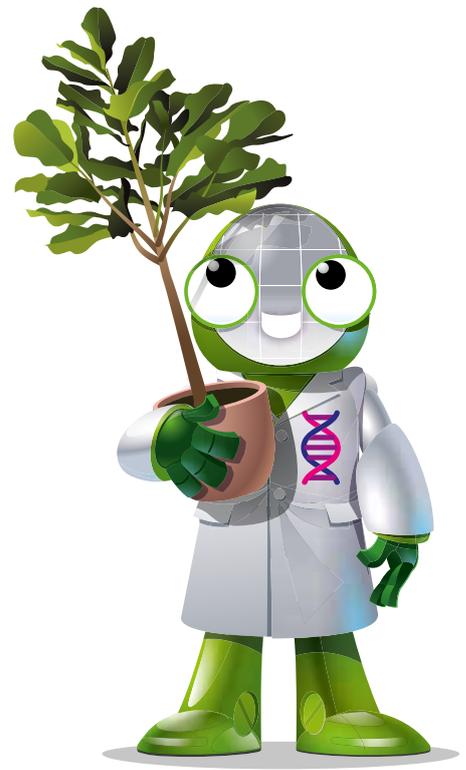
**1.2 Parts of the human body**

## Exploring science further

Numbered activities from the Student Book are expanded with example answers for guidance. Learners can record their scientific progress, insights and results.

## Assessing progress

End of topic checklists provide opportunities for recording what learners have learnt so far.



## Other types of skeleton

Animals do not have a bony skeleton inside their body. They are called invertebrates. Some invertebrates have a hard covering on the outside of their body called an exoskeleton. Other invertebrates do not have a skeleton.

Where are the muscles, joints and skeleton on this animal?



It is not like us. It does not have a skeleton.

Is Azumi correct? Why do you say so?

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**16** 1 Skeleton and muscles



# Workbooks

## Workbooks 1 – 6

Workbooks are designed for extended practice and consolidation in class or at home, where the learners are able to express and record the development of their scientific thinking through carefully thought out games, quizzes, questions and activities. The workbook pages are clearly cross-referenced with the corresponding stage in the student books.

### Glossary

Fill in the meaning of these words in your own language.

<b>dark</b>	<b>shadow</b>
_____	_____
_____	_____
<b>light</b>	<b>Sun</b>
_____	_____
_____	_____
<b>shade</b>	<b>torch</b>
_____	_____
_____	_____

11

Workbook 2

### Practising my science language

Cup 3 tastes \_\_\_\_\_  
Cup 3 smells \_\_\_\_\_  
What do you think is in cup 3?  
I think it is \_\_\_\_\_

**What is in the bags?**  
Your teacher will give you three bags with objects inside them.

- Get into groups. Take it in turns to feel the objects in the bag.
- Choose two words from the word box to describe each one.

hard soft smooth rough grainy  
round square heavy light squishy bendy

The objects in bag 1 feel \_\_\_\_\_  
The objects in bag 2 feel \_\_\_\_\_  
The objects in bag 3 feel \_\_\_\_\_

- What do you think is inside each one? Look at the words in the box.

marbles dry beans sand wooden blocks feathers  
rubber bands string cotton wool foam

I think bag 1 holds \_\_\_\_\_  
I think bag 2 holds \_\_\_\_\_  
I think bag 3 holds \_\_\_\_\_

2 1.1 Living things can sense their surroundings

Workbook 2

### 3.4 Pollination and fertilisation

**1 Why do plants make pollen?**  
Work in a small group. Write a summary of your ideas about why insects regularly visit flowers.  
Insects visit flowers because \_\_\_\_\_  
\_\_\_\_\_

**Extension**

a. Make some notes about hay fever. What is the role of pollen in causing hay fever?  
b. Use your notes to produce a booklet about hay fever for people to read in a doctor's waiting room. Make sure you mention the role of pollen.

**Practising my science language**

**2 Acting out pollination**  
Work in a group of five or six. On a separate piece of paper, plan a presentation of what happens in the process of pollination. You can either:

- act out pollination as it actually happens in nature
- or make up your own story to model pollination using the ideas of advertising, rewards and the movement of things from one place to another. You can create images as part of the story.

58 3.4 Pollination and fertilisation

Workbook 5

### Practising my science language

**2 Helping people to understand science**

A factory owner and a fisherman live 80 km apart. The fisherman is angry because he has just found out what acid rain is doing to the fish. The factory owner cannot see what the fuss is about.

You know that you can explain what is happening. What will you say to these two people? Can you help both of them?

I will tell them \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Extension**

The gases and smoke from factories can be cleaned and some of the dangerous chemicals removed. This involves a filtration unit placed inside the factory, but it is expensive. Who do you think should pay for it?

I think \_\_\_\_\_ should pay for it because \_\_\_\_\_

70 5.1 SpaceShip Earth – the atmosphere

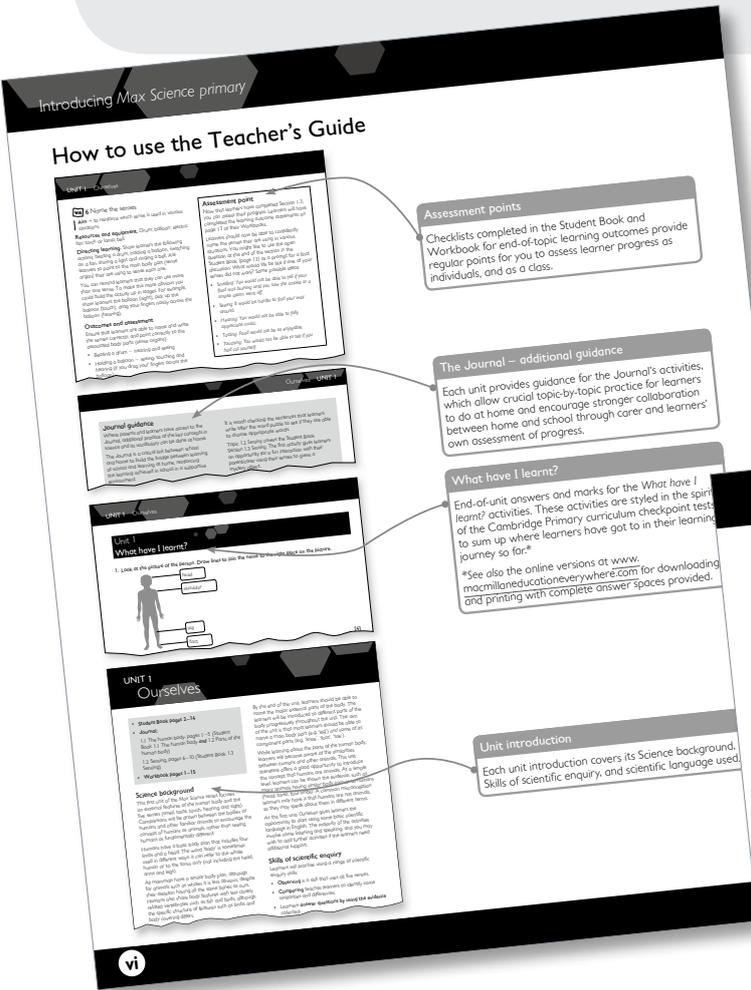
Workbook 6



# Teacher's Guide

## Teacher's Guide 1 – 6

The Teacher's Guide comes with full support to help teachers plan and deliver active, engaging and productive lessons giving guidance on assessment and differentiation. Each topic includes a section on potential scientific language challenges students may face. Full answers to all activities are also provided.



## Teacher's Presentation Kit 1 – 6

The Teacher's Presentation Kit offers a suite of easy-to-use, materials for interactive whiteboards or projectors. It includes a digital version of the Student Book enhanced with scientific language activities for front of class teaching as well as a packed resource centre full of activity sheets that can be downloaded and printed for whole class engagement. These help focus on the development of scientific skills, word cards and audio glossary for scientific vocabulary learning and teacher's notes and full answers are included for all activities.



## PRIMARY • YEARS 1 – 6

The *Max Science Enquiry Box* series is a flexible resource that supports the development of scientific skills and follows the Cambridge Primary Science curriculum framework.

Over 6 stages, each Enquiry Box contains a range of activity cards to facilitate enquiry-based learning across the subjects of Chemistry, Biology and Physics.

Activities throughout the series support a student-centred, hands-on approach, and guide learners through the stages of collecting ideas, planning work, presenting evidence and drawing conclusions. The *Max Science Enquiry Box* series helps students develop their understanding of concepts through practical application, while teachers are supported in delivering a modern and relevant science class.

A 'Scientific Enquiry' strand is also included to support teachers and students who need to focus on the development of enquiry-based learning skills, and raise confidence with the approach.

The *Max Science Enquiry Box* series features:

- four strands to support the Cambridge international primary curriculum: Biology, Chemistry, Physics and 'Scientific Enquiry'
- support for teachers who are focusing on the development of enquiry-based learning skills with their students
- embedded language support for learners and teachers whose first language may not be English
- over 100 free, downloadable online resources for each stage which includes Worksheets, Teacher's Notes and Answer Keys (with language support) and Answer Keys
- step-by-step guidance for teachers on how to approach and scaffold lessons appropriately to encourage students to work both independently and collaboratively on key tasks.



Endorsed by Cambridge Assessment International Education for classroom support.



Sample material from *Max Science Enquiry Box 1*

Max Science Enquiry Box 1	9781380019912	Max Science Enquiry Box 4	9781380019943
Max Science Enquiry Box 2	9781380019929	Max Science Enquiry Box 5	9781380019950
Max Science Enquiry Box 3	9781380019936	Max Science Enquiry Box 6	9781380019967



## A resource designed for your classroom

No matter where you are on your STEM journey, you can feel confident and supported using STEM Investigations. Our expert authors have done the hard work for you so you can explore the amazing world of STEM education with your students at the pace and depth of your choice.

### Tick every box with STEM INVESTIGATIONS:

- ✓ Easy to use
- ✓ Highest quality
- ✓ Expert authors
- ✓ Supports classroom differentiation
- ✓ Curriculum aligned
- ✓ For Middle and Upper Primary (Years 3 – 6)

## What's in the Box?

- 120 laminated student cards (A4 size):
  - 20 different investigations organised into five themes
  - Six copies of each card (and you can print more)
- A comprehensive, full-service Teacher Resource Book with digital resources



**DESIGN A QUAKE-RESISTANT BUILDING**

**THE CHALLENGE**  
The main risk to life during an earthquake is the collapse of poorly built buildings. After a devastating earthquake, volunteer organisations often work with local communities, helping them to rebuild. You want to join a junior volunteer team, but first you must impress the selection panel.

**KEY UNDERSTANDINGS**  
This challenge will help you understand:  
 • The Earth has five layers: inner core, outer core, lower mantle, upper mantle and crust.  
 • The Earth's crust is made up of many pieces, called tectonic plates.  
 • Tectonic plates move against each other.  
 • The surface where one plate slips past another is called the fault or fault plane.  
 • When plates slide against each other, this creates earthquakes.  
 • The hypocentre is the location below the Earth's crust where an earthquake starts.  
 • The epicentre is on the Earth's surface, directly above the hypocentre.  
 • Buildings that are flexible are more likely to withstand an earthquake.

**KEY SKILLS**  
This challenge will help you:  
 • Make careful observations.  
 • Transform an idea into something that can be seen.  
 • Consider different points of view.  
 • Develop research skills.  
 • These buildings in Nepal collapsed due to a major earthquake. How could you make sure a building won't collapse?

**BUILT WORLD**  
STEM INVESTIGATION 3

**The challenge**  
Gives the challenge parameters and general guidance, including questions to consider. Also outlines the key scientific learning linked to the topic.

**Key vocabulary**  
Lists key terms that are important for understanding the concepts explored in the investigation. Definitions and ideas for developing investigation-related vocabulary are provided in the Teacher Resource Book.

**Key concepts**  
Identifies the key concepts associated with the challenge.

**Key actions**  
Gives an overview of the main actions students will be expected to perform. Actions may also form part of student assessment.

**Design thinking stages**  
Gives an overview of the main activities associated with each stage of the design thinking process.

**KEY ACTIONS**  
During this challenge, you will perform the following tasks:  
 • Find out information from eyewitnesses of earthquakes.  
 • Experiment with different shapes and materials.  
 • Explore ways of making a structure strong and flexible.  
 • Design a way to create a building that can stay standing when the ground vibrates.

**KEY VOCABULARY**  
earthquake-resistant  
epicentre  
fault  
hypocentre  
magnitude  
tectonic plate

**DESIGN THINKING STAGES**  
As part of your challenge, you need to follow the five-step design thinking process.

**EMPATHISE**  
Gather information, consider points of view and identify eyewitness responses.

**DEFINE**  
Work out the main issues that relate to buildings surviving an earthquake.

**IDEATE**  
Come up with some creative ideas for building an earthquake-resistant building.

**PROTOTYPE**  
Choose one or two of your ideas and create them. Spend time making changes and trying new ways to create your idea.

**TEST**  
Check which ideas work best. Choose a final design to share.

**BIG PICTURE**  
The modern palace buildings of the Forbidden City in Beijing, China, were built in 1497. They have survived more than 200 earthquakes in the past 600 years.

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STEM Box Years 5 - 6	978-1-4202-4154-9



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