Let's Do SCIENCE

Kindergarten

Textbook A

The 5E Model – Guided Inquiry

The Let's Do Science series is based on the Biological Sciences Curriculum Study (BSCS) 5E teaching and learning instructional model. The 5E model is centered on the idea that students understand science concepts best by using prior knowledge to pose questions and find answers through guided inquiry.

This hands-on approach, integrated with engineering and design skills, has students learn science by doing science. Teachers guide the learning process and are able to assess student performance by evaluating student explanations and the application of newly acquired knowledge and skills.

Engage

The Engage phase of the 5E model provides students with the opportunity to demonstrate their prior knowledge and understanding of the topic or concept. Students are presented with an activity or question which serves to motivate and engage students as they begin the lesson. Teachers identify and correct any misconceptions and gather data from students which will guide informed teaching and learning.

Essential to stimulating and engaging students is the use of mixed media such as colorful photos, illustrations and diagrams found throughout the textbooks and activity books. Let's Do Science also includes extensive digital resources such as narrated videos, interactive lessons, virtual labs, slideshows and more.

Explore

This phase encourages exploration of concepts and skills through hands-on activities and investigations. Students are encouraged to work together and apply various process skills while gaining concrete, shared learning experiences. These experiences provide a foundation for which students can refer to while building their knowledge of new concepts. This student-centered phase comes before formal explanations and definitions of the concept are presented by the teacher.

Explain

This phase follows the exploration phase and is more teacher-directed. Students are initially encouraged to draw on their learning experiences and demonstrate their understanding of the concept through explanations and discussion. After the students have had the opportunity to demonstrate their understanding of the concept, the teacher then introduces formal definitions and scientific explanations. The teacher also clarifies any misconceptions that may have emerged during the Explore phase.

Elaborate

In the Elaborate phase, students refine and consolidate their acquired knowledge and skills. Opportunities are provided for students to further apply their knowledge and skills to new situations in order to broaden and deepen their understanding of the concept. Students may conduct additional investigations, share information and ideas, or apply their knowledge and skills to other disciplines.

Evaluate

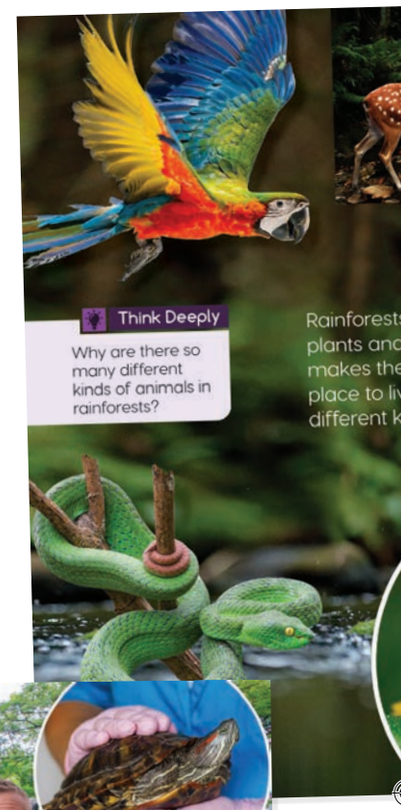
This final phase includes both formal and informal assessments. These can include concept maps, physical models, journals as well as more traditional forms of summative assessment such as quizzes or writing assessments. Students are encouraged to review and reflect on their own learning, and on their newly acquired knowledge, understanding and skills.

Let's Do Science

Let's Do Science is based on the United States Next Generation Science Standards (NGSS). The series consists of full-color textbooks and full-color activity books for Grades K to 6.

Let's Do Science engages students with a highly visual presentation of the disciplinary core ideas in the textbooks and places an emphasis on applying scientific knowledge using NGSS practices through numerous scientific investigations. Let's Do Science sees engineering as an essential element of science education and as such is tightly integrated into both the textbooks and activity books.

The Let's Do Science textbooks include the following features:



Think Deeply

Topic-related questions for group discussion aimed at deepening students' understanding of the topic.

Engineer It!

Goes beyond inquiry by encouraging students to design, model and build to engineer solutions to defined problems.

In the Field

Inspirational science-related professions to stir interest in science-related careers.

A Closer Look

Invokes enthusiasm in science by presenting interesting topics beyond the syllabus.

Amazing Fact!

Interesting facts to build interest and enthusiasm.

Did You Know?

Extra information to build students' knowledge base of the current topic.

Try This!

Optional hands-on activities to be conducted in groups or at home.

AB Activity

Links students to the Let's Do Science Activity Book at the appropriate juncture.

Discussion

Topic-related questions and situations for class discussion to build a deeper understanding of topics.

Review

Topical questions at the end of each chapter for formative assessment.

Science Words

Lists the essential science vocabulary covered in each chapter.

Contents

Science Skills

Scientists use special skills to learn about the world around them.

Let's look at how you can use these skills so you can be a scientist too.

Observe

You **observe** when you gather information about something using your senses. You can observe how something looks, feels, sounds, smells or tastes.

What senses are the children using to observe?

You can use different tools to observe things closely. You can use a hand lens, binoculars or a telescope.

Compare

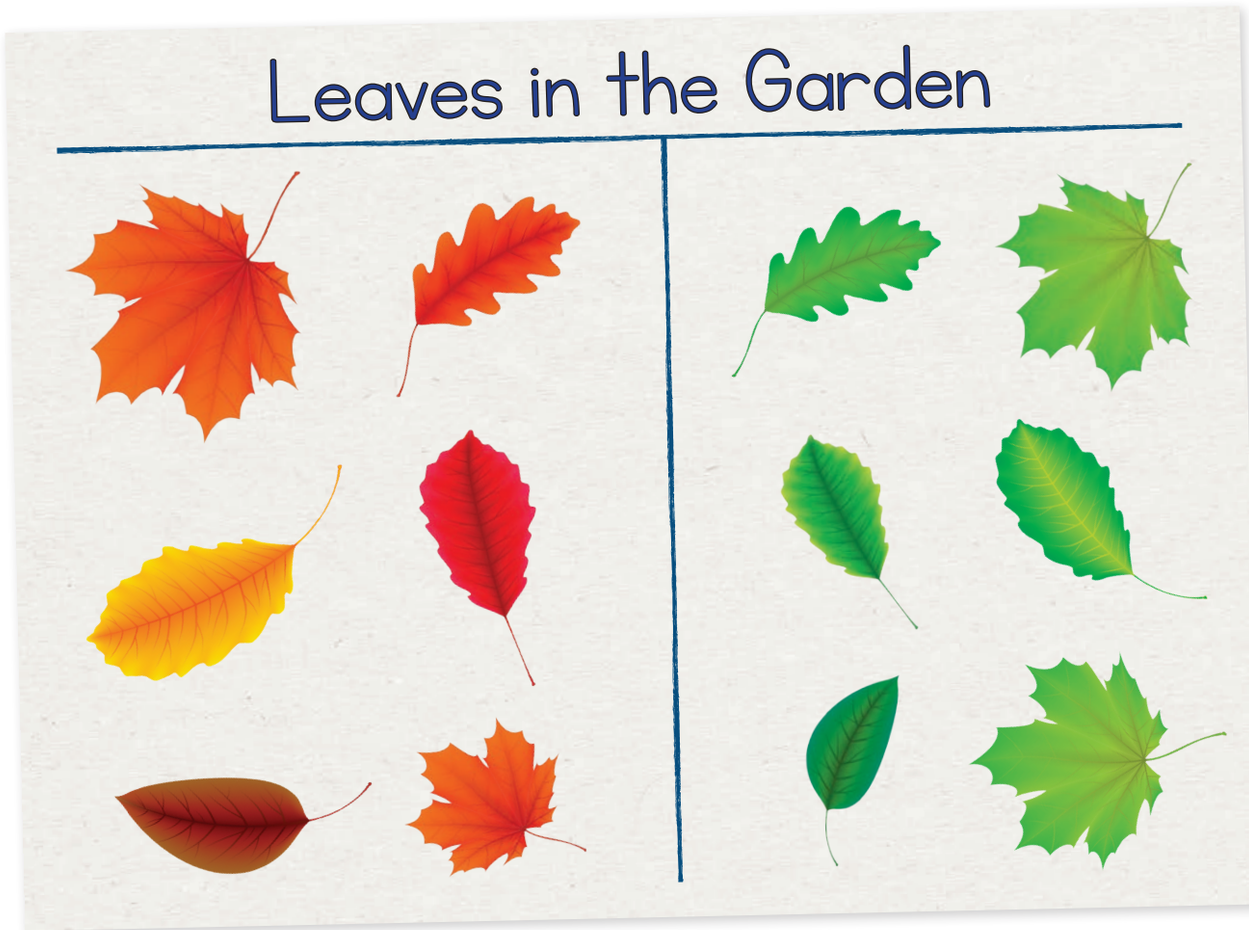
You **compare** things when you observe and tell how things are similar or different.

How are the hen and chick similar? How are they different?

Classify

When you compare two or more things, you can **classify** them into groups based on ways they are similar.

How have the leaves been classified into groups?



Measure

You **measure** when you find the size or amount of something.

You can use tools to help you measure things. You can use a ruler to compare and measure length.

You can use a balance to compare and measure mass.

Make a Model

You can make a model to test or see how something works.

You can make a model by drawing a picture.

You can also make a model by using the things around you to make a smaller version of something to show how it works.

Infer

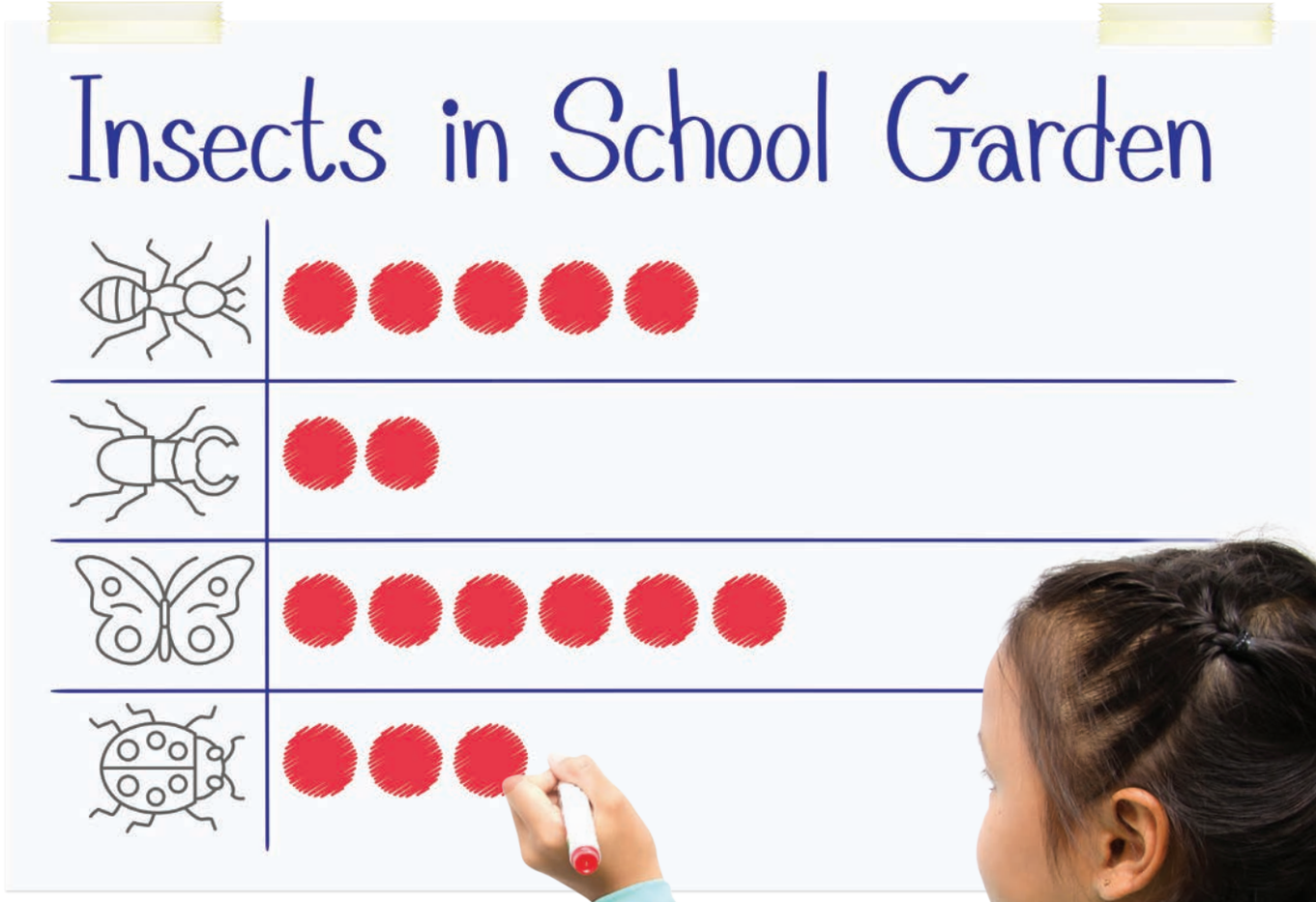
You **infer** when you make a guess about something based on what you know or what you observe.

What can you infer about the cause of the holes in the leaf?

What can you infer from observing the tracks in the sand?

Communicate

You **communicate** when you tell or show other people what you find out.



You can communicate by making charts, drawing pictures or writing about what you find out.

Science Investigations

Ask Questions

Before a science investigation, ask questions about what you would like to find out.

Make a Prediction

A prediction is a guess about what you will observe before you make the observation.

What are some things you would like to find out about in science?

Plan and Carry Out an Investigation

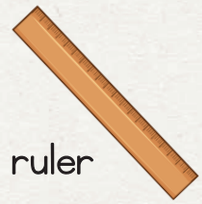
Make a plan with steps that others can follow. List all the materials you will need.

Procedure

1. Measure the heights of the plants.
2. Put one plant near a window. Put the other plant in a dark cupboard.
3. Water and observe the plants every day for one week.

Materials

two plants



ruler

spray bottle with water

Observe and Record Data

Record the things you observe. You can write or draw the things you observe. You can use charts and tables.

Analyze and Interpret Data

You analyze when you look closely at recorded data.

You interpret when you understand and explain what the data means.

Make a Conclusion and Communicate

Make a conclusion. Communicate your conclusion to others.

Science Safety

Follow these safety rules when carrying out investigations.

Wear safety gear.

Follow your teacher's instructions.

Keep your workspace clean.

Be careful with sharp objects.

Wash your hands after every activity.

1 Living Things Around Us

What are living things? How can we tell if something is a living thing?

In this chapter you will ...

- identify living things and non-living things.
- list the needs of living things.
- list the characteristics of living things.

What do plants, animals and people need to survive?

Go Online!

Access interactive content relating to this topic on the NGScience website.
ngscience.com

What Are Living Things?

Think Deeply

How can you tell if something is a living thing?

Living things are things that are alive.

People are living things.

Plants and animals are living things too.

What are some living things you see around you?

Try This!

Walk around your schoolyard with your friends. Draw three living things you see.

AB Activity 1.1

Think Deeply

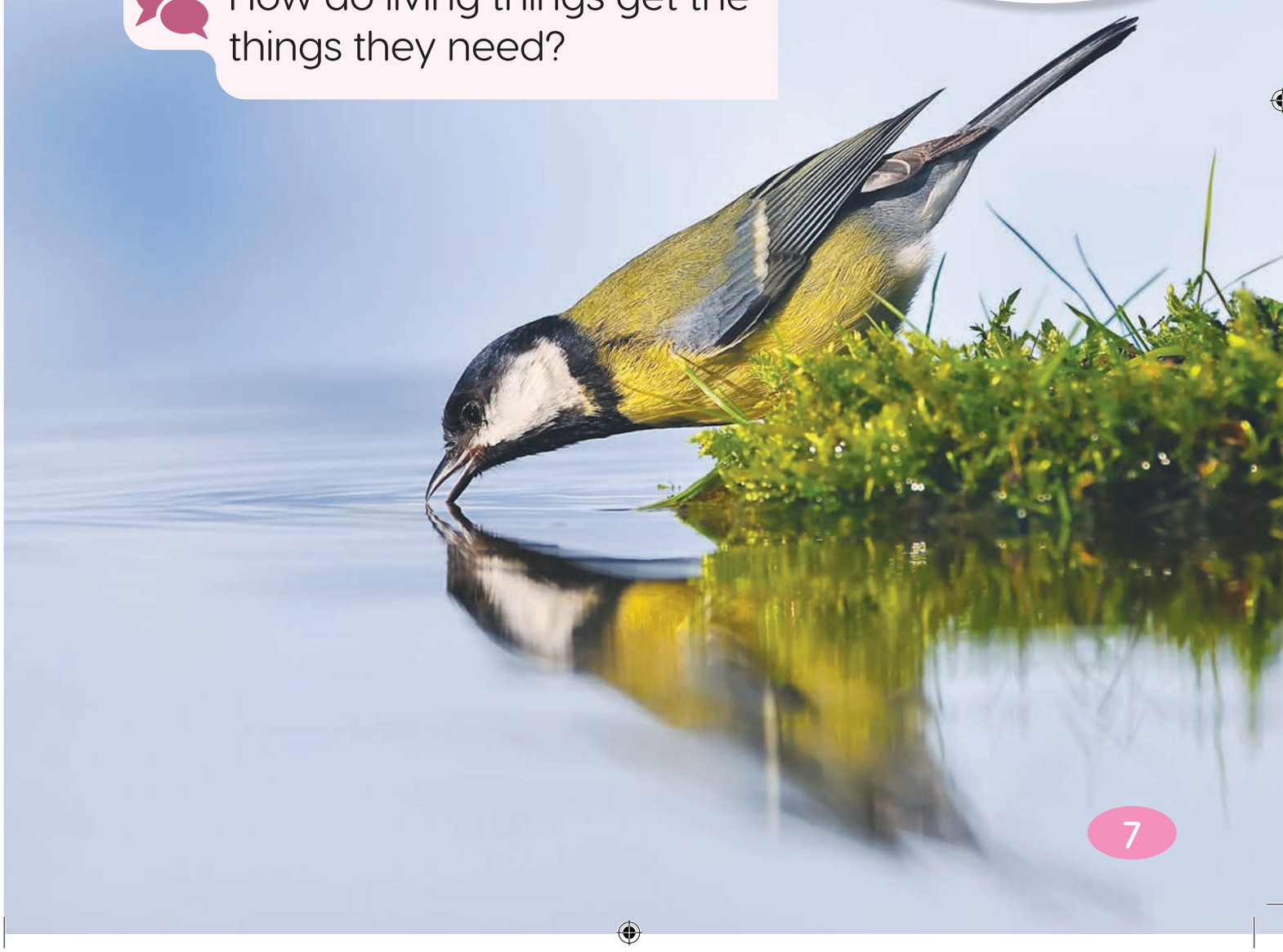
How are the needs of animals different from the needs of plants? How are they the same?

Needs of Living Things

Living things need the same things to survive.

What things do people, animals and plants need?

How do living things get the things they need?



Needs of Animals

Animals need **food**.

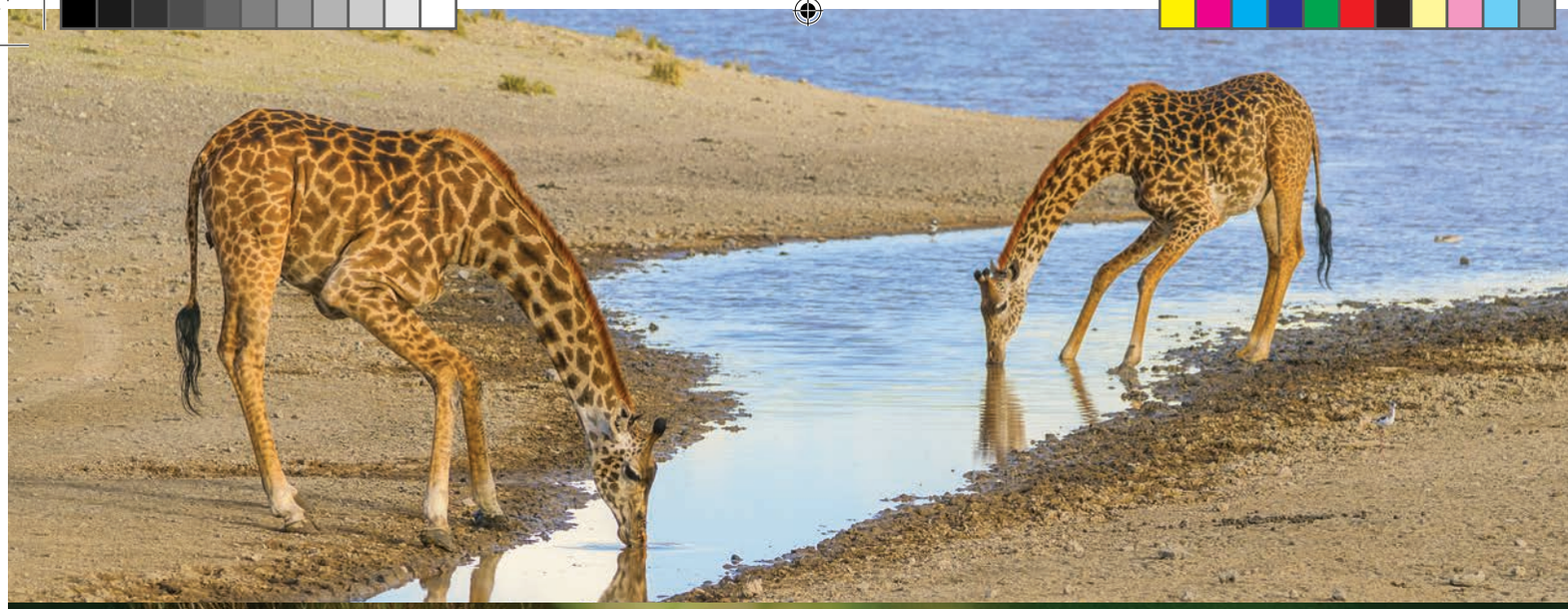
Some animals get their food by eating plants.

Amazing Fact!

Elephants can eat for up to 20 hours in one day!

Some animals get their food by eating other animals.

Other animals get the food they need by eating both plants and animals.



Animals need **water**.

Where do animals get the water they need?

Animals in nature can get the water they need from ponds, lakes and rivers.

Some animals get the food and water they need from people.

What things do people do to care for their pets?

Amazing Fact!

The kangaroo rat can go its whole life without drinking water! It gets water from the seeds it eats.

Animals need **air**.

Most animals on land breathe in air through their noses and mouths.

Fish have special parts called **gills**. Gills help fish to get the air they need from water.

AB Activities 1.2 – 1.3

Think Deeply

Dolphins and whales live in the ocean, but they do not have gills. How do they get the air they need to survive?

Go Online!

Watch how different animals get the things they need on the NGScience website. *QuickCode:* **P7T7**

Needs of Plants

Plants need **sunlight**.

Plants do not eat food like people and animals. They use the energy in sunlight to make their own food.

What happens if a plant does not get enough sunlight?

Plants need **air**.

They use the air to help them make food using sunlight.

Amazing Fact!

Plants make food through the process of **photosynthesis**. The word photo means ‘light’ and the word synthesis means ‘putting together’.

Plants need **water**.

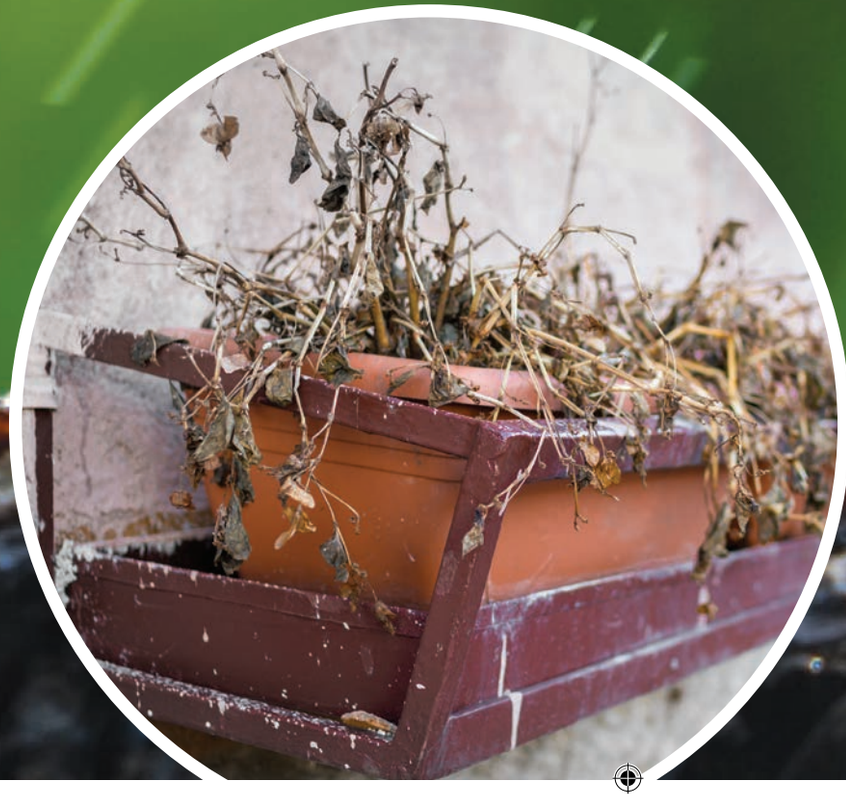
Water helps a plant to make food using air and sunlight.

Plants take in water from the ground through their roots.

AB Activity 1.4

Plants in crops and gardens get most of the water they need from people.

What happens if a plant does not get enough water?



Needs of People

People, like animals, need food, water and air.

We eat plants and animals for food.

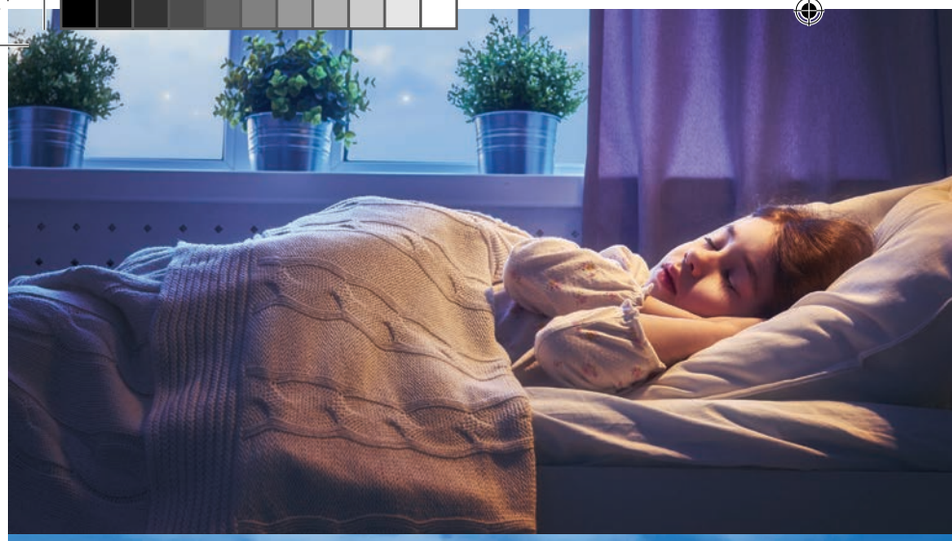
Try This!

Get together with your friends and make a list of the different types of plants or plant parts people eat.

We drink water.

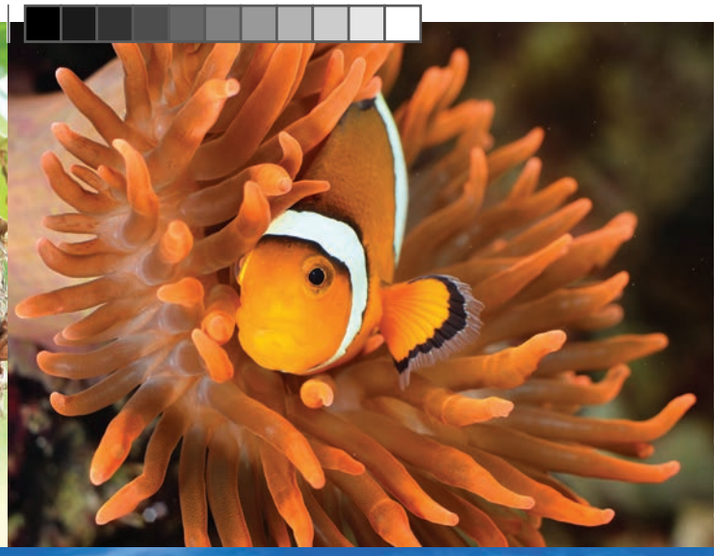
We breathe in the air around us.

How do you get the food, water and air you need?



A Place to Live

All living things – people, plants and animals, need a place to live.



The place where a living thing lives must provide it with **shelter** and all the things it needs to survive.

AB Activity 1.5

Engineer It!

Sophie and Chelsea have a pet snail. Help them design and build a home for their snail.

Characteristics of Living Things

We can group the things around us as living things and non-living things.

You have learned that living things need air, food and water to survive.

Non-living things are things that are not alive. Non-living things do not need air, food or water.

Living Things Move

Living things **move**.

People and animals are able to move from place to place.

Try This!

Act out how different animals move. Have your friends guess the animal.

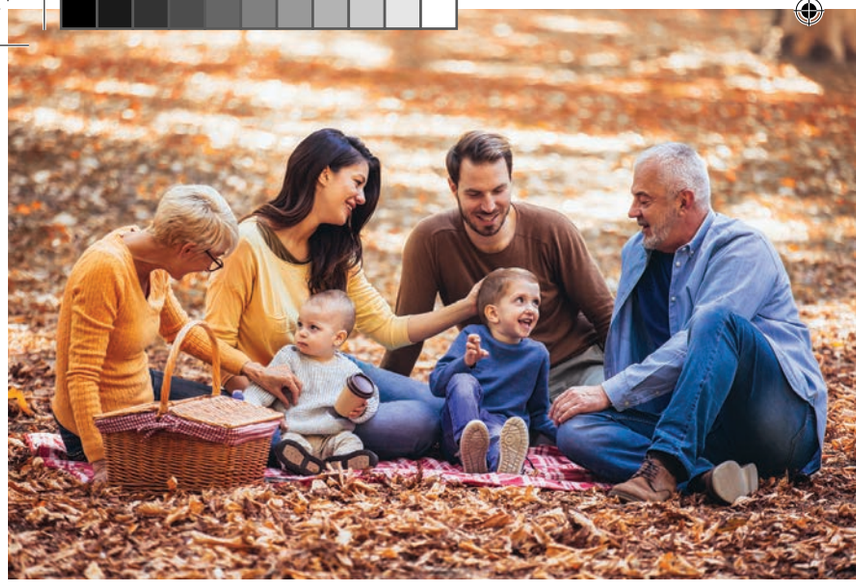
Plants cannot move from place to place, but some plants can move their parts.

What are some other ways plants around us move?

AB Activity 1.6

Amazing Fact!

The Venus flytrap can close its leaves to catch insects. It feeds on the insects for food!



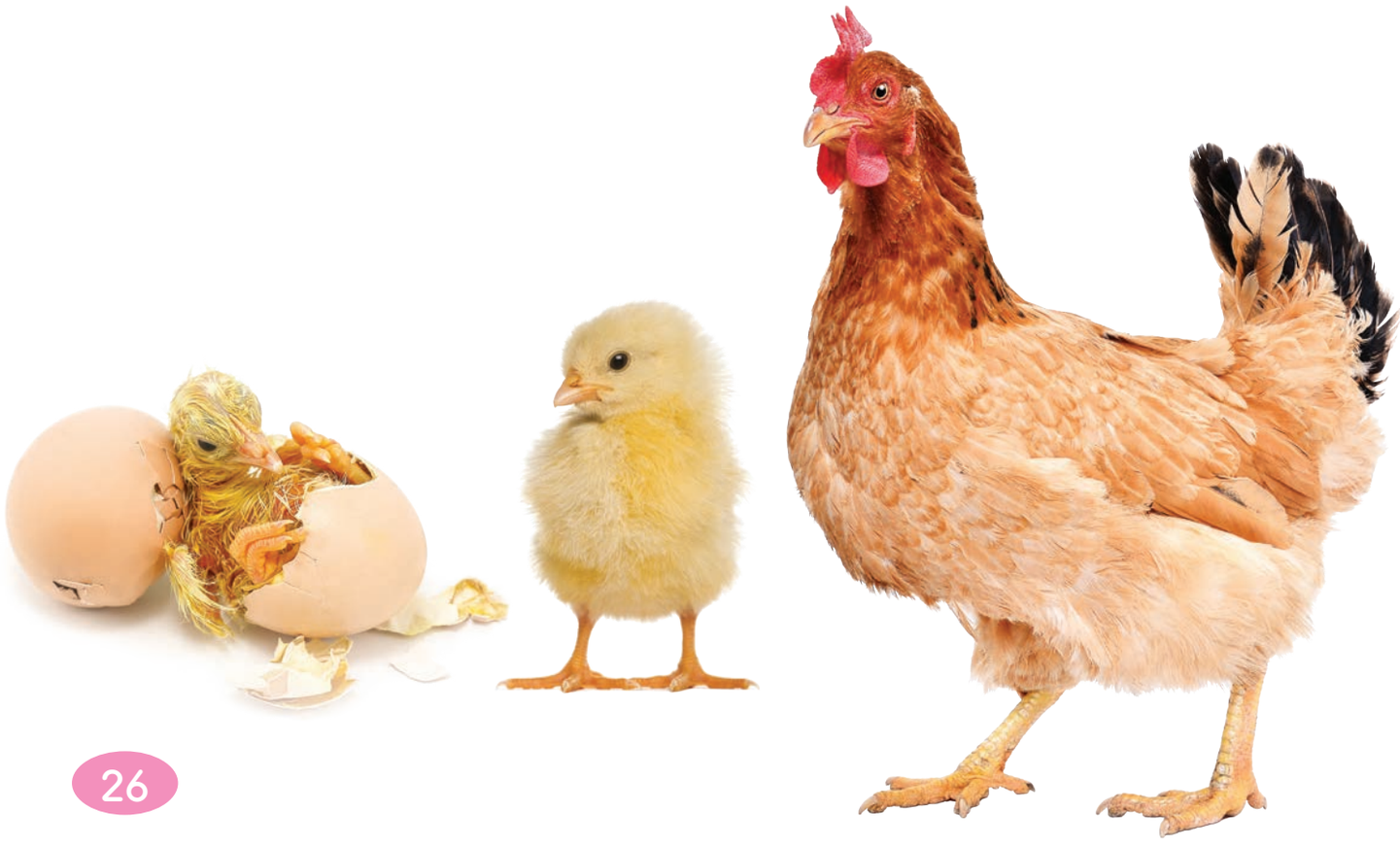
Living Things Grow and Reproduce

Living things can make new living things. They **reproduce**.

The new living things **grow** and change to look like their parents.

Think Deeply

How do animals care for their young when they are born or hatch?



An oak tree produces seeds from which new plants grow.

The oak seedling will grow into an oak tree.

AB Activity 1.7

How does the oak seedling change as it grows?

What Are Non-living Things?

Toys, books, tables and chairs are non-living things.

Non-living things cannot move by themselves.

Try This!

Make a poster to show the differences between living and non-living things.

Non-living things do not have young.

Non-living things do not grow.

Look around your classroom. What non-living things can you see? How can you tell they are non-living things?

AB Activities 1.8 – 1.9

Science Words

living thing	**sunlight**
non-living thing	**shelter**
food	**move**
water	**reproduce**
air	**grow**

Review

1. List three things living things need.

2. How do animals get food?
   (a) They make their own.
   (b) They use sunlight.
   (c) They eat other living things.

3. List two animals that eat plants for food.

4. List two animals that eat other animals for food.

5. How do plants get food?
   (a) They make their own food.
   (b) They eat other plants.
   (c) They drink water.