

+ Explore your book!

Richmond Solution BE Primary Science 3 includes ten units in four different areas of science: **Biology**, **Chemistry**, **Physics** and **Earth and Space**.

Each unit teaches a different topic.

Engage!

Start your adventure here! Think about what you already know about the topic. How does it relate to your life?

Explore!

Carry out an experiment or observation! This is a chance to explore the topic and your ideas. Make observations and draw conclusions.

Explain!

Read explanations of new ideas.

UNIT 3

Animals

Engage!

Make an animal gallery!

Make a poster about your favorite animal or an animal you find interesting. It can be a land animal or an aquatic animal. Be creative! Use old magazines or find photos and information on the internet. When you have finished your poster, put it on the wall together with your classmates' posters.

- Look at all the posters. Which ones do you like the most?
- What kind of animal is the most popular?
- Which animals are similar? In what ways are they similar?
- How can you group the animals?

Explore!

Which animals have a spine?

Objective: Think about how to sort living things into groups.

Method

- Work in groups. Find 10 pictures of animals. Choose animals that are very different.
- Print or cut out the pictures. Write the name of the animal on each picture.
- Research which of your 10 animals have a spine (backbone). Complete the table.

You will need

- books or the internet for research
- pictures of animals

Observations

- Complete the table.

These animals have a spine. They are vertebrates.	These animals do not have a spine. They are invertebrates.

Find and write three more examples for each column.

Conclusions

- Look at the vertebrates. Are they similar in any other ways?
- Look at the invertebrates. Are they similar in any other ways?
- Are there more species of invertebrates or vertebrates? Use the internet to research the answer to the question.

Explain!

Lesson 3.2

What do different animals eat?

Animals cannot produce their food like plants do. So most animals have to move to find their food. One way that we can classify animals is by the type of food they eat. Animals can be **herbivores**, **carnivores** or **omnivores**.

Herbivores only eat plants or parts of plants, like roots, leaves and fruit. Some herbivores, like cows and horses, eat grass and vegetables.

Carnivores eat the meat of other animals. Snakes and sharks are examples of carnivores. They move quickly to attack their **prey**. Some carnivores, like tigers, have sharp

A horse is a herbivore.

Explain!

Practice

- Choose the correct ways to end the sentences.
 - Herbivores eat...

☐ plants and other animals.
 ☐ other animals.
 ☐ only plants.
 - Carnivores eat...

☐ plants and other animals.
 ☐ other animals.
 ☐ only plants.
 - Omnivores eat...

☐ plants and other animals.
 ☐ other animals.
 ☐ only plants.
- Investigate. Use the internet to research the food these animals eat. Then classify them as herbivore (H), carnivore (C) or omnivore (O).

a. ☐

c. ☐

e. ☐

b. ☐

d. ☐

f. ☐

Extend!

Check your understanding and find out more!

Explain!

Lesson 3.3

What is a food chain?

The living things in a habitat are connected by what they eat. A **food chain** shows this connection. It also shows how energy passes from one living thing to another. Look at the example below.

grass → zebra → lion

The food chain shows that in this habitat, a zebra eats grass, and a lion eats a zebra. So the energy flows from the grass to the zebra and from the zebra to the lion.

All food chains start with plants. In food chains, plants are called **producers** because they make their own food. Animals in the food chain are called **consumers**. They eat plants and other animals. There is another group of living things, too. They are called **decomposers**. These are **bacteria** and **fungi** that **decompose** (break down) the remains of dead plants and animals. They release nutrients that living plants absorb from the ground.

Practice

- Match the words with the descriptions.

a. decomposers	They eat plants or other animals, or both.
b. consumers	They make their own food.
c. producers	They break down the remains of plants and animals to release nutrients.
- Look at the pictures. Add three arrows. → Then answer the questions.

a. Which living thing in the food chain is a producer?

b. Which living things in the food chain are consumers?

- Order the living things from 1 to 4 to make a food chain.

a. ☐

b. ☐

c. ☐

d. ☐

Evaluate!

Check your progress!
At the end of each unit,
there are plenty of
activities to see how
much you have learned.

Check my progress

1 Write three food chains.

```

graph LR
    A[ ] --> B[ ]
    B --> C[ ]
    C --> D[ ]
    
```

2 Classify these living things. Put an X in the correct columns.

Living thing	Producer	Consumer	Decomposer
a. grass			
b. tree			
c. dog			
d. cat			
e. bacteria			
f. grass			
g. ant			
h. fungi			
i. fish			
j. seaweed			

Order this food chain from 1 to 5.

- The rabbit eats the plants.
- The plants use the Sun's energy to make food and grow.
- The eagle eats the snake.
- The decomposers release nutrients from the remains of the eagle.
- The snake eats the rabbit.

3 Write three examples of herbivores, carnivores and omnivores.

herbivore: _____

carnivore: _____

omnivore: _____

4 Match.

a. Fish	have scales. They lay eggs and breathe with lungs.
b. Amphibians	have fur. They give birth to live young and breathe with gills.
c. Reptiles	have scales, fins and no legs. They lay eggs and breathe with gills.
d. Birds	have wet skin. They lay eggs and breathe with lungs and gills.
e. Mammals	have feathers, two legs and wings. They lay eggs and breathe with lungs.

Glossary

A **absorb** Take in (e.g., energy or liquid)

adaptation / adapted A special feature of a living thing that helps it survive

anus The hole through which solid waste leaves the body

artery One of many narrow tubes that carries blood from the heart to all parts of the body

atom The smallest particle of a substance

attract Pull toward

axis The imaginary line through Earth from the North Pole to the South Pole

B **bacteria** A tiny living thing that can cause disease

balanced forces Forces that act against each other but are of the same strength, so there is no change in movement

branch A part of a tree that grows out from the trunk

C **carbon dioxide** A common gas that plants use in photosynthesis to make food and all living things produce during respiration

carnivore An animal that only eats other animals

cell The smallest unit of every living thing

chlorophyll A green substance in plants that makes it possible for them to absorb light energy and make food from carbon dioxide and water

circulatory system The system of blood, the heart, arteries and veins that transports gases and nutrients around the body

consumer A living thing that gets energy and nutrients by eating other living things

D **decompose** Break down into more simple parts

decomposer A living thing that gets energy and nutrients by breaking down dead matter

digestive system The system in the body that breaks down food and absorbs nutrients

dissolve (Of a solid) mix with a liquid and form a solution

E **energy** The capacity of something to do work or be active

environment The surroundings of a living thing

esophagus A tube that connects the throat to the stomach

evaporation The change from a liquid to a gas

F **feather** Any one of the light parts covering a bird's body

filter Something that is used to separate out the solids from a liquid, or a gas

fin One of the thin, flat parts on the outside of a fish that helps it swim

flexible Capable of bending

flower The part of a plant that is often colorful and is involved in reproduction

fluid Able to flow like water

food chain A series of living things, each dependent on the previous one as a source of food

force Something that pushes or pulls an object and affects its movement

force meter An instrument that measures the strength of a pull or a push

fossil The remains or impression of a prehistoric living thing

fossil fuel A fuel (such as coal, oil or gas) formed underground from plant or animal remains

fossilization The process by which the remains of living things become fossils

friction A force that causes an object to slow down when it is in contact with another object

fuel A material that is burned to produce heat or power

fungus (plural: **fungi**) A living thing that looks like a plant but does not have flowers and that eats dead things

fur The body covering of a mammal

Glossary

At the back of the book, there is a Glossary with definitions of all the important scientific words you will need to understand.

This science course helps you develop these global skills, too.
Look out for these symbols next to activities:



Collaborative learning

Work with others to improve your knowledge and develop your interpersonal and social skills.



Critical thinking

Apply what you have learned, analyze information, form new ideas and communicate them to others.



Research

Find out new things about the topic in books or online, select important information and present your findings.



Social and emotional development

Respond to topics as an individual or as a member of society and discuss your thoughts and feelings about them.

+ Contents

UNIT 1

Life processes **Biology**

+ How similar are living things?	6
+ 1.1 What are the common features of living things?	8
+ 1.2 What is a life cycle?	10
+ 1.3 How do living things reproduce?	12
+ 1.4 How are animals born?	14
+ 1.5 What are the basic needs of living things?	16
✓ Check my progress	18

UNIT 2

Plants **Biology**

+ I know the parts of a plant!	20
+ 2.1 What are the parts of a plant?	22
+ 2.2 What types of roots do plants have?	24
+ 2.3 What types of stems do plants have?	26
+ 2.4 What do leaves do?	28
+ 2.5 Why do plants have flowers?	30
✓ Check my progress	32

UNIT 3

Animals **Biology**

+ Which animals have a spine?	34
+ 3.1 How do we classify vertebrates?	36
+ 3.2 What do different animals eat?	38
+ 3.3 What is a food chain?	40
+ 3.4 What is a food web?	42
✓ Check my progress	44

UNIT 4

The human body **Biology**

+ What do you know about your body?	46
+ 4.1 What does your heart do?	48
+ 4.2 What do your lungs do?	50
+ 4.3 Where does your food go?	52
+ 4.4 What does your brain do?	54
✓ Check my progress	56

UNIT 5

Solids, liquids and gases **Chemistry**

+ Describe it and guess what it is!	58
+ 5.1 What is matter?	60
+ 5.2 What is a solid?	62
+ 5.3 What is a liquid?	64
+ 5.4 What is a gas?	66
✓ Check my progress	68

UNIT 6

Mixtures **Chemistry**

+ Homemade slime!	70
+ 6.1 What is a mixture?	72
+ 6.2 How do we separate mixtures?	74
+ 6.3 What is a solution?	76
+ 6.4 How are mixtures and solutions useful in our lives?	78
✓ Check my progress	80

UNIT 7

Forces **Physics**

+ How do we use forces to move objects?	82
+ 7.1 What is a force?	84
+ 7.2 What are balanced forces?	86
+ 7.3 What is gravity?	88
+ 7.4 How do we measure force?	90
+ 7.5 What is friction?	92
✓ Check my progress	94

UNIT 8

Light and magnetism **Physics**

+ Does light go through it?	96
+ 8.1 Does light pass through all materials?	98
+ 8.2 What are shadows?	100
+ 8.3 What is a magnet?	102
+ 8.4 What are magnets used for?	104
✓ Check my progress	106

UNIT 9

Earth's materials **Earth and space**

+ How can you make a fossil?	108
+ 9.1 What is a fossil?	110
+ 9.2 How are fossils made?	112
+ 9.3 What can we mine from rocks?	114
+ 9.4 What are fossil fuels?	116
✓ Check my progress	118

UNIT 10

Earth, the Moon and the Sun **Earth and space**

+ Does the Moon always look the same?	120
+ 10.1 What is the connection between Earth, the Moon and the Sun?	122
+ 10.2 How does Earth move?	124
+ 10.3 What are the phases of the Moon?	126
✓ Check my progress	128
✓ Glossary	130