Module 1 Life Processes

What group does this animal belong to?

Class activity  Sorting objects
Page 8

Toy animals  Pencils  Buttons

Class activity  Using a key to identify animals
Page 9

Left-hand animal type: arachnids/spiders.
Middle animal type: molluscs.
Right-hand animal type: crustaceans.

Any two reasons why the spider is not in the same part of the key as the snail: the spider has legs; the spider has a jointed body; the snail has a shell.

Home learning  Types of vertebrates
Page 10

Any two reasons from: a whale gives birth to live young; a whale feeds its young on milk; a whale breathes through lungs; a fish has gills, a fish has scales.

Any two reasons from: penguins do not have scales, gills or fins; a penguin has feathers, a beak and lays hard eggs on land.

Any two reasons from: a bat has fur; its young are born live and the young are fed on milk; a bat does not have feathers, lay eggs or have a beak.

Going further
A duck-billed platypus is a mammal.

Staying alive

Home learning  Finding fruit and vegetables
Page 11

1 More than once, ideally three times.
2 There could be seasonal changes in the fruits and vegetables seen.
3 In a table.
4 Show the table of results to others and see if they got the same or different results.
5 Table and chart.
6 Students should tick a (bar chart) and c (pie chart).

Home learning  The hearing game
Page 12

Students should realise that the shape of the ear helps sound to travel from the air and into the ear. This is why animals turn their ears towards a sound – so more sound is collected.

Class activity  How tall are animals?
Page 13

The horse is the tallest animal.
The rabbit is the shortest animal.

It is easier to compare heights using a bar chart because the height of the bar is a visual way of comparing heights. The tallest bar represents the tallest animal.
Home learning  Your family timeline
Page 14

Students should find that as people grow older, from being babies to adults, they become taller. Around age 21 years, most people stop growing and in later years may even become less tall.

Home learning  Find the important words
Page 15

d o v s p e c i e s
i s o l c t f n c y
m e g g s p g k b a
o f f s p r i n g x
v y p g u c a r e v
h r e p r o d u c e
q v y t n h a l j t
a z b a b i e s s p u

Students should mention any three of the following ways that humans care for their babies: keeping the baby warm; keeping the baby dry; feeding the baby; washing the baby; keeping the baby safe.

Is this living or non-living?

Home learning  How animals move
Page 16

Possible answers:

<table>
<thead>
<tr>
<th>Way of moving</th>
<th>An animal that does this</th>
<th>Can humans move in this way? Yes or no?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run</td>
<td>Leopard/horse/cat</td>
<td>Yes</td>
</tr>
<tr>
<td>Walk</td>
<td>Camel/elephant/goat</td>
<td>Yes</td>
</tr>
<tr>
<td>Jump</td>
<td>Kangaroo/flea/frog</td>
<td>Yes</td>
</tr>
<tr>
<td>Swim</td>
<td>Fish/whale/dolphin/turtle</td>
<td>Yes</td>
</tr>
<tr>
<td>Crawl</td>
<td>Insect/lizard</td>
<td>Yes</td>
</tr>
<tr>
<td>Slide</td>
<td>Snake/worm</td>
<td>Yes</td>
</tr>
<tr>
<td>Fly</td>
<td>Bird/bat/butterfly</td>
<td>No</td>
</tr>
</tbody>
</table>

Living things can: breathe, grow, excrete, eat and reproduce.

Two non-living things students may have seen could be stone buildings, glass objects, plastic toys, metal objects or wooden furniture and window frames.

How can we help plants to grow?

Home learning  How are animals and plants different?
Page 17

I need water.

I can move from place to place.

I grow and produce seeds.

I can make my own food using energy from the sun.

The label ‘I need water’ links to both the person and the plant.

Two ways that humans and plants are different:
1. Plants make their own food.
2. Humans can move.

Class activity  Planning a fair test
Page 18

Students should discover that the plants grown in the dark and those without water show the least healthy growth. Those grown in light but cold conditions will have done better, but not as well as those grown in warm and light conditions.
What we have learned about life processes

Home learning  What I have learned...
Page 19

1. Birds
2. Feed
3. Plants
4. Reptiles
5. Move
6. Slide
7. Touch
8. Concrete
9. Senses

Word in the shaded area: REPRODUCE
‘Reproduce’ means to make young or offspring.

Module 2 Materials

Materials around us

Class activity  Finding different objects
Page 22

Possible answers:

<table>
<thead>
<tr>
<th>Property</th>
<th>Example of an object in the room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard</td>
<td>Table/door</td>
</tr>
<tr>
<td>See-through</td>
<td>Window/vase</td>
</tr>
<tr>
<td>Soft</td>
<td>Blanket/cushion</td>
</tr>
<tr>
<td>Shiny</td>
<td>Mirror/metal bowl</td>
</tr>
<tr>
<td>Rough</td>
<td>Wooden block/rock sample</td>
</tr>
<tr>
<td>Smooth</td>
<td>Mirror/any named metal object</td>
</tr>
<tr>
<td>Breaks easily (brittle)</td>
<td>Glass/vase</td>
</tr>
<tr>
<td>Strong</td>
<td>Bricks/metal tools</td>
</tr>
<tr>
<td>Heavy</td>
<td>Metal weight/rock/stone</td>
</tr>
<tr>
<td>Bouncy</td>
<td>Bouncy ball</td>
</tr>
</tbody>
</table>

Home learning  Using properties at home
Page 23

Soft object: teddy bear, blanket, cushion or carpet.
Shiny object: mirror, metal cutlery or jewellery.
Hard object: tool, door, work surface, wall or floor.
See-through object: window, vase, glass ornament or drinking glass.

Home learning  Materials game
Page 24

Instructions for a game so no student answers.

Home learning  Slippery or safe?
Page 25

The elastic band will stretch if it is used to pull a heavy weight.
The elastic band will stretch less if it is used to pull a light weight.
If the surface of the floor is slippery, less force will be needed and the elastic band will stretch less.
The forcemeter (elastic band) and the object will stay the same.
The surface will change.
Students should record their results in a table.
Students may suggest that tiled, lino, wooden or laminate floors are slippery.
Students should circle ‘More slippery’.

Is is magnetic?

Home learning  Which objects at home are magnetic?
Page 26

1 and 2 Students’ predictions will vary.

3 Students’ own answers.
Possible uses of magnets at home: 1 fridge door, 2 fridge magnets, 3 magnetic notice board.

Class activity Identifying N and S poles of a magnet
Page 27
Opposite poles attract and like poles repel.

Home learning Make a compass
Page 28
Answers will depend on where the student lives. Check their answers using a compass.

Just right for the job

Class activity Testing insulators
Page 29
Students’ predictions will vary.
Students’ measurements will vary, but the felt will insulate better than cotton or paper.
Felt would be the best material for a coat.

Going further
The materials should each be of the same thickness and a lid should either be put on all or none of the beakers in order for the investigation to be a fair test.

Home learning Soaking up spills
Page 30
Possible table design:

<table>
<thead>
<tr>
<th>Material</th>
<th>Volume after 2 minutes (cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Going further
The investigation in school has more control variables. Using the scales to measure the weight of the paper is more accurate. It also measures to decimal points.

Class activity Invent an object
Page 31
Students’ answers will vary.

Sorting materials

Home learning Making a match
Page 32
Metal > Hard, strong, shiny, easy to shape
Fabric > Soft, bendy, absorbent
Plastic > Hard, strong, waterproof
Glass > Transparent, breaks easily, waterproof, shiny
Possible answers:
Metal – cutlery, pans, door handles, tools.
Fabric – curtains, clothes, blankets, cushions.
Plastic – cutlery, mixing bowls, measuring jugs, cups.
Glass – windows, drinking glasses, vases.

What we have learned about materials

Home activity What I have learned...
Page 33
Clue box 1 The properties of materials describe how a material looks or behaves.
Clue box 2 Common materials: wood, plastic, glass, fabric, rubber.
These materials are used to make objects.
Magnetism is a force between materials.
Clue box 3 Some materials are better for a job than others. For example, a paper windscreen in a car would not do a good job.
Clue box 4 Materials could be sorted into soft, hard, strong, brittle, shiny, bendy or transparent.

Module 3 Flowering Plants

Parts of a flowering plant

Class activity Make a model of a plant
Page 36
Labels from top to bottom: flower, leaf, stem, roots.
Students’ own answers.
Home learning Main parts of flowering plants
Page 37
Students should record the types of materials they used for their model (such as card, cloth, pipe-cleaners and straws) and link these to the part of the plant they are representing. For example, flat and flexible materials such as card and cloth for the leaves and flowers, and thinner, harder materials such as pipe cleaners and straws for stems and roots.

What do plants need so they can grow?

Home learning Scientific enquiry wordsearch
Page 38

| o | i | n | t | a | b | l | e |
| g | r | a | p | h | a | p | b | a | k |
| v | g | w | l | t | p | l | a | n | x |
| p | u | g | v | y | k | h | l | l | z |
| f | t | m | e | a | s | u | r | e | j |
| a | l | j | x | s | h | o | m | q | e |
| f | r | e | s | u | l | t | s | o | l |
| v | o | b | s | e | r | v | e | y | s |
| q | w | p | r | e | d | i | c | t | q |
| f | a | i | r | t | e | s | t | f | w |

Example definitions:
Predict: to make an educated guess about the outcome.
Plan: to design an investigation or test.
Fair test: to control all the variables except the independent variable, which is the one thing you change.
Observe: to record what you see.
Results: the measurements and observations made in an investigation.
Graph: a method of displaying results.
Table: the place where results are recorded.
Measure: to use equipment and devices to find out the size or how much of something there is.

Class activity Plant investigation
Page 39
Students should formulate a clear question:
- For whether plants need water, a suitable question would be: ‘Do plants that are given water grow taller than the same type of plants that are not given water?’
- For whether plants need light, a suitable question would be: ‘Do plants that are grown in light grow better than the same type of plants that are grown in the dark?’

Students’ predictions should be an answer to the question – yes or no – and should be accompanied by an explanation based on prior knowledge and experiences.

Students should only change the variable they are investigating (light or water). All other variables (temperature, type of soil, growth conditions, type of plant) should be kept the same.

To determine whether or not plants are growing more healthily, students can measure the height of the plants, the thickness of their stems, count the number of leaves and compare how green they are. They can measure using a tape or ruler and record their answers in a results table and present these results as a chart.

Home learning Photosynthesis competition
Page 40
1. Examples of words made from photosynthesis: synthesis, the, hot, pot, toes, thesis, top, those, yes and soot. (Many others are possible.)
2. Examples of words beginning with ‘photo’: photography, photographer, photogenic, photocell and photocopy.

How do plants take in water?

Home learning Grow a bean seed
Page 41
Students should observe that the roots of the bean appear first, followed by the stem and leaves. The roots and stem slowly grow larger over the next few days – the roots growing downwards and the stem growing upwards. Students may observe hairs on the roots.
Going further

Roots grow downwards as they need to spread through the soil to anchor the plant and obtain water. The stem grows upwards and rises above the soil so that the leaves can be in sunlight.

Class activity  Do leaves affect how a plant transports water?

Page 42

Students should observe that celery stems with more leaves transport more water than those with fewer leaves. Water is lost from leaves by evaporation (transpiration) and this draws water up the stem. More leaves results in more evaporation and so more water is drawn up the stem.

Healthy plants

Home learning  The power of roots

Page 43

Students could draw examples of roots growing out of pavements, kerb stones, road surfaces, walls and even through concrete patios and floors. They should notice and draw that the roots damage their surroundings, for example, walls will be more crumbly and concrete can be cracked.

Home learning  Tree survey

Page 44

The names and total number of trees counted in the survey will depend on your local area. The uses of trees will possibly include firewood, building, foods, medicines and making paper.

Not too hot and not too cold!

Class activity  Seedling investigation

Page 45

Students should find that most plants tested grow best in warm, light places. Green plants will not survive in dark places for significant periods of time and, though some plants are adapted to survive in cool places and others in hot places, many prefer warm temperatures.

Home learning  Make your own greenhouse

Page 46

Students may suggest many designs for their greenhouse, but they should include a waterproof and insect-proof cover such as plastic. Ideally, this should be transparent so the plants can be observed without removing the cover too frequently. The cover should be designed so it can be lifted up, however, to allow weeding, watering and letting cooler air in if the greenhouse becomes too hot. The greenhouse should also have a tray for holding soil or compost and drainage holes so water can drain away and not waterlog roots.

What we have learned about flowering plants

Home activity  What I have learned...

Page 47

1  Answers in any order:
   a  Roots
   b  Leaves
   c  Stems
   d  Flowers

2  Students should talk about and then list the following functions in any order:
   a  Roots – for anchoring the plant in soil and taking in water.
   b  Leaves – for making food using energy from sunlight.
   c  Stems – to hold the plant upright and to transport water from the roots.
   d  Flowers – for making seeds.

3  Answers in any order:
   a  Roots anchor the plant.
   b  Roots absorb (take in) water from the soil.

4  True
Module 4 Introducing Forces

Pushes and pulls

Class activity Find the forces
Page 50

Students’ own answers.

Home learning Pushes and pulls at home
Page 51

1 Push: students could draw a door, drawer or window being pushed closed. The arrow will be away from the person.

2 Pull: students could draw a door, drawer or window being pulled open. The arrow will be towards the person.

Home learning Make a forcemeter
Page 52

Possible answers:

<table>
<thead>
<tr>
<th>Object</th>
<th>Size of force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toy car</td>
<td>Medium</td>
</tr>
<tr>
<td>Wooden block</td>
<td>Large</td>
</tr>
<tr>
<td>Plastic block</td>
<td>Medium</td>
</tr>
<tr>
<td>Paper plate</td>
<td>Small</td>
</tr>
</tbody>
</table>

Making shapes with forces

Home learning Make your own play dough
Page 53

Students should be familiar with pushing, pulling, squashing and twisting the play dough and the effects these forces have.

Class activity Use forces to change the shape of modelling clay
Page 54

Students’ pots will probably be different shapes and sizes.

Students could measure the size of the pot using a ruler or they could weigh out how much clay they use using a scale.

Planning my investigation Students will need: clay, a smooth surface and tools to model the clay.

What students are going to change: students could suggest any specific changes to the shape of the clay that will become the pot.

What students are going to keep the same: the amount of clay.

What students are going to measure: the size of the pot.

What students are going to do: they can push, pull, squash and twist the clay to make a pot.

Forces can stop things moving

Home learning Bouncing ball investigation
Page 55

Throwing the ball at a wall is a push. The harder the ball is thrown, the less time it takes to return.

Students could throw the ball harder to make it come back more quickly.

Students could throw the ball softer, or with less force, to make it come back more slowly.
Class activity  Measuring distance
Page 56

Students should circle the tape measure or metre stick.

Class activity  Vehicles travel further on some surfaces
Page 54

Students may predict that smoother surfaces make the car travel a greater distance.

Their reason may be that smoother surfaces reduce friction, which is a force that slows moving objects down.

My investigation plan
Students will need: guttering, card, books, toy car, different surfaces.

What students are going to change: surface.

What students are going to keep the same: the car and angle of ramp.

What students are going to measure: the distance the car travels.

What students are going to do: release the car from the top of the ramp and measure the distance the car travels.

Students will be careful to measure accurately to the front or back of the car each time.

Students’ drawings should be similar to the one in Stage 3 Student Book on page 82.

Home learning  Surface investigation
Page 58

The ice skater moves so quickly because there is very little friction between the thin, sharp blade of the skate and the shiny, smooth surface of the ice.

Students’ answers will vary, but larger or rough objects will need more force.

Students’ answers will probably be yes.

Possible table design:

<table>
<thead>
<tr>
<th>Object</th>
<th>Force needed (easy/hard)</th>
<th>Force needed using ice cube (easier/harder)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The ice reduces friction.

Forces can affect speed and direction

Home learning  Which shoe?
Page 59

Ice skating
Dancing
Walking
Ice climbing
Playing football
Running on a track
Running on mud

The shape of the sole or tread is designed to create friction and stop you slipping.
Home learning  Rolling a ball
Page 60
Possible table design:

<table>
<thead>
<tr>
<th>Person</th>
<th>Distance from wall (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Students may suggest changing the amount of force on the ball.

What we have learned about introducing forces

Home activity  What I have learned...
Page 61
1 a pull, b push, c pull, d push, e pull
2 a False, b True, c True, d True, e True, f False

Module 5 The Senses

Taste

Class activity  Taste and colour
Page 67
Students will usually predict that the darker the colour the more taste it will have, but this is rarely the case.

Students’ predictions are probably not very accurate as using just sight is not ideal to predict flavour. Sight used with smell is more accurate.

Home learning  Why should we chew our food?
Page 68
1 Bitter/savoury
2 Sweet

Going further

Chewing food helps it to digest.

Smell

Home learning  Different smells
Page 69
Possible answers to how smell gives pleasure: flowers, perfume, cooking food.
Possible answers to how smell warns of danger: fire, smoke, decaying or bad foods, dust, pollen.
Possible answers to smells we would miss: favourite food being cooked, BBQ, sweets, perfume, flowers.

People may make any of the suggestions above or have other relevant ideas.

Home learning  Flowers and their scents
Page 70
Flowers will vary according to your local area.
Going further

The scent travels from the flower to the nose as we breathe in air. This enters the nostrils where millions of small cells called receptors send messages to the brain. The brain works out what the smell is.

Nerves that detect smell
nose
nostril
flower

Hearing

Class activity Lip reading
Page 73

Some students may have difficulty reading the lips of other students.

Students should recognise oval, circular, wide and flat lip shapes.

They may sometimes see the tongue.

Students’ own answers.

Home learning Using Morse code
Page 74

Hearing is missing from the word bank.

What we have learned about the senses

Home activity What I have learned...
Page 75

Students’ eyes probably tricked them.

Students’ own answers.

Sight

Home learning How important is eyesight?
Page 71

The sportspeople are being helped by visual people.

Students will probably have problems directing the food into their mouth without spilling any. They may also state that it is a bit worrying putting something in your mouth that you cannot see because it would be difficult to know what it is.

Students’ own answers.

Class activity Tricking your eyes
Page 72

Students should see small grey circles where the white lines cross.

Students will probably think that line A is longer than line B.

Top line measures 5 cm.
Bottom line measures 5 cm.
Module 6 Keeping Healthy

The life processes

Class activity  How much should we eat?
Page 78

Going further

Food group that contains the most energy in every gram: fat.
Food group that contains the least energy in every gram: fibre.

Young adults need more energy than older adults because young people are still growing and are often more active.

Four-year-old children need more energy than babies because babies do not move around so much and are smaller.

15-year-old boys need more energy than 15-year-old girls because boys are developing more muscle.

Home learning  Designing a poster
Page 79

Posters should be clear, colourful and include all of the key words.

Diet and exercise

Home learning  Healthy eating
Page 80

Students’ choices for a healthy breakfast should contain carbohydrate, such as unsweetened cereal, fruit, vegetables and protein, but little or no fatty or sugary foods.

Going further

An average healthy breakfast is likely to contain 500 to 800 kilojoules.
The water should look clearer after being filtered. The cotton wool in the filter will look dirtier as it has trapped some of the solid materials.

**Going further**

Students' own answers.

**Home learning  Food for a long walk**

**Page 84**

Students should advise the walkers to take a range of carbohydrates, such as cereal bars and wholemeal bread, and fruits, such as bananas and apples.

These provide a slow release of energy.

The walkers should take plenty of water – up to two litres or more if the weather is very hot.

**Class activity  Energy for different activities**

**Page 85**

Activity that needs most energy every hour: working on a building site because this activity involves heavy lifting and a lot of movement.

Sport that needs most energy every hour: cycling in a race because the cyclists must move very quickly, use the big muscles in their legs and may have steep hills to ride up.

A student doing homework will use approximately 15 kilojoules every hour.

**Class activity  Heart rates**

**Page 86**

Students should find that their heart rate (pulse rate) increases with exercise. This is to meet the demand for oxygen and food (glucose) for energy in the muscles.

**Damaging foods**

**Home learning  Favourite foods**

**Page 87**

Students should realise that fruits, nuts, vegetables and carbohydrates, such as cereals, are healthier than sweet and fatty foods.
Home learning  Our teeth
Page 88

Lions have large canine teeth to allow them to bite and tear meat from their prey.
Cows have large molars to help them to crush and grind grass.
Students can look after their teeth by: brushing and cleaning them regularly; consuming fewer sugary and acidic foods and drinks; and having their teeth checked regularly by a dentist.
Foods that you would not be able to eat easily if you did not have teeth: any difficult to bite or chew foods, such as hard fruits and vegetables and tough meats.

What we have learned about keeping healthy

Home activity  What I have learned...
Page 89

Students should be familiar with the following answers:
What is nutrition? Feeding (the foods and drinks we consume to obtain nutrients).
Name one way that exercise helps to keep us healthy. Exercise helps to keep fat levels lower and makes the heart more healthy.
Name three food groups. Any three from: protein, carbohydrate, fat, minerals, water and vitamins.
Why is insulin vital for our health? It controls the amount of sugar in the blood.
Name two life processes. Any two from: movement, respiration (breathing), sensing the environment, nutrition (feeding or eating), growth, reproduction or excretion (getting rid of waste).
What do our lungs do? They allow oxygen to enter the blood and carbon dioxide to leave.
To keep healthy, we need to eat some of all of the food groups. What is this diet called? A balanced diet.
What decays teeth? Drinking acidic drinks or eating sugary foods – acids make the microorganisms in the mouth break down sugars.

Quiz yourself

Page 90

1 Life Processes

Living or non-living?

<table>
<thead>
<tr>
<th>Does it move?</th>
<th>Does it grow?</th>
<th>Does it breathe?</th>
<th>Does it eat?</th>
<th>Is it living or non-living?</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Living</td>
</tr>
<tr>
<td>✕</td>
<td>✕</td>
<td>✕</td>
<td>✕</td>
<td>Non-living</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Living</td>
</tr>
<tr>
<td>✕</td>
<td>✕</td>
<td>✕</td>
<td>✕</td>
<td>Non-living</td>
</tr>
</tbody>
</table>

2 Materials

3 Metal > Saucepan. Possible properties: can be shaped (malleable), shiny, heatproof.
Stone > Wall. Possible properties: strong, easy to shape, hard.
Paper > Newspaper. Possible properties: can be made into thin sheets, bendy.
Glass > Window. Possible property: transparent.

Page 92
3 Flowering Plants
5 a and b
Flower > 4 These often have a nice smell and colour to attract insects. This is also the place where seeds are produced.
Leaf > 2 These use the energy from sunlight to make food.
Stem > 1 This supports the plant and transports food and water around it.
Roots > 3 These keep the plant anchored in the soil. Some have hairs that help the plant to get water.

Page 93
6 a
b Soil, carbon dioxide and warmth.

4 Introducing Forces
7 a twist, b push, c pull, d pull, e push, f twist

Page 94
8

Page 95
10 a 1 No.
2 Yes.
3 Lines C and D are the same length.
b 1 Side A = 2.5 cm, Side B = 2.5 cm.
2 Yes.
3 Line C = 2.5 cm, Line D = 2.5 cm.
c Sight

6 Keeping Healthy

Page 96
11

Page 97
12

5 The Senses
9 Middle picture: sight
Right-hand picture: smell
Students’ drawings will vary.