Module 1 Skeleton and Muscles

Human and animal skeletons

Home learning Make a skeleton
Page 8

The skeletons constructed by students should match the one below. No need for labels for bones.

Going further

The skull protects the brain.
The ribs protect the heart and lungs.
The leg is not made of a single large bone so it can bend – at the joint (knee).

Class activity What is bone made from?
Page 9

Yes

Students will find that the rolled-up paper tube does stand up and support the apple. They will also find that the tube is stronger along its length – downward – than across.

Super skeletons

Home learning Growing bigger
Page 10

1 I predict that a person’s skeleton gets bigger as they get older.

2 To reduce any errors in measurement.

3 Students should see a relationship between the lengths of the body parts – people with longer arms are also likely to have longer forearms and feet.

Yes, people’s skeletons get bigger as they get older, but after a certain age the growth will stop and in later years the skeleton may shrink slightly.

Home learning Protecting your organs
Page 11

Brain
Skull
Heart
Ribs
Lungs
Class activity  Seeing through bodies
Page 12

A cat. Also accept tiger, leopard or other large cat.

X-rays are important because they allow doctors to see inside the body to check if bones are broken or damaged.

Muscles and skeletons

Home learning  Important muscles
Page 13

How muscles work together

Home learning  Look, cover, label, check
Page 14

Students’ diagrams should be the same as the diagram in the Workbook, so students can learn to memorise it.

Class activity  Muscle pairs
Page 15

Elastic band A pulls to move the arm up. Elastic band B pulls to move the arm down.

A is a bicep.

B is a tricep.

Medicines

Class activity  Medicines
Page 16

A medicine works with the body to make us feel better. Some medicine can cure illness. Some medicine can make the symptoms better.

If someone gets a bacterial infection, they need to take antibiotics. Antibiotics kill the bacteria that make the person feel unwell. It is important to take all the antibiotics to make sure that all the bacteria are killed.

Some people have allergies, for example hay fever. People with allergies can take a medicine called antihistamines.

It is very important to use medicine safely. If we take too much medicine it can make us unwell. Medicine labels have instructions about how much medicine to take and how often to take it.

Home learning  Allergies
Page 17

Students should ask as many people as possible and record their findings in the table. They can then calculate the most common allergy and identify some that were not mentioned.
Students should identify antihistamines as suitable medicine for allergies.

Home learning  Health leaflet  
Page 18
Having selected an illness to concentrate on – diabetes or asthma – students should present clear information about the illness they have researched. Their leaflet should include the causes, symptoms and details of treatment, cures and prevention.

What we have learned about the skeleton and muscles

Home activity  What I have learned...  
Page 19

Across
1 The upper limb of the body.
6 Substances that can be taken to help to cure illness.
7 The part of the skeleton protecting the brain.

Down
2 The parts of the body that contract and relax to move bones.
3 The types of medicines used to kill bacteria.
4 The hard parts of the body that make up the skeleton.
5 The parts of the skeleton that protect the heart and lungs.

Module 2 Solids, Liquids and Gases

Are they solids, liquids or gases?

Home learning  What are solids, liquids and gases like?  
Page 22

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Solid</th>
<th>Liquid</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does it have a fixed volume?</td>
<td>Yes</td>
<td>Yes</td>
<td>No. It changes to fill the container.</td>
</tr>
<tr>
<td>Does it have a fixed shape?</td>
<td>Yes</td>
<td>No. It changes shape to fit the shape of the container.</td>
<td>No. It fills the container.</td>
</tr>
<tr>
<td>How dense is it?</td>
<td>Very dense</td>
<td>Dense</td>
<td>Not dense</td>
</tr>
<tr>
<td>How easy is it to squash?</td>
<td>Hard to squash</td>
<td>Hard to squash</td>
<td>Easy to squash</td>
</tr>
<tr>
<td>Does it flow?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Examples of solids: wood, plastic, stone, brick, metal or ceramic objects.
Examples of important liquids: water, detergents, washing-up liquids, fruit drinks, petrol, diesel and cooking oils.

Going further

Gases are easy to squash because the particles are far apart. Solids are hard to squash because the particles are already packed closely together.

Solid Gas

Home learning  Examples of different states  
Page 23

Solid, liquid and gas.

Students’ tables should show the particles arranged in a similar way to those on page 30 of Stage 4 Student Book.
<table>
<thead>
<tr>
<th>State of matter</th>
<th>Examples I have found</th>
<th>How the particles are arranged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>Many examples such as cooking gas, air and steam.</td>
<td>![Gas Diagram]</td>
</tr>
<tr>
<td>Liquid</td>
<td>Many examples such as water, fruit juices, petrol, paraffin, diesel, washing-up liquid and detergents.</td>
<td>![Liquid Diagram]</td>
</tr>
<tr>
<td>Solid</td>
<td>Many examples such as metal pots and pans, plastic toys and utensils, wooden furniture, stone and brick buildings and pot (ceramic) objects.</td>
<td>![Solid Diagram]</td>
</tr>
</tbody>
</table>

**Class activity Investigate different shaped containers**

**Page 24**

1. The most likely choice will be container D, but accept others as one of the points of the task is to realise that appearances can be deceptive and volumes should be tested/measured.

2. Students should list a measuring cylinder or jug, water and a range of different sized and shaped containers.
   Students should decide to use a measuring cylinder or measuring jug to measure the volume of water each container holds.
   Results should be recorded in a table.

3. Results will depend on the containers used, but students should use their measurements of volume and not the appearance of the containers.
   Students could improve their investigation by using a more accurate measuring cylinder (those that are 10 cm³ are more accurate than those that are 100 cm³ for example), and they could repeat their measurements.
   Students should learn that as liquids take on the shape of a container, the shape could sometimes mislead them in estimating volumes. Conical shapes appear to hold more, for example, and these are used in the perfume industry.

**Home learning Make a gas**

**Page 25**

Students should notice that the gas produced by the reaction between baking soda and vinegar (carbon dioxide) fills the balloon. The balloon can be squashed easily because the gas particles are far apart.

**Heating and cooling**

**Home learning Investigate melting**

**Page 26**

Particles of chocolate before melting:

Particles of chocolate during melting:

Particles of chocolate after melting:

To obtain solid chocolate from melted chocolate or ice cream the substances must be cooled. This process is called freezing.
Home learning  Evaporating and boiling
Page 27
In warm weather or in a warm room, water vapour can escape from the surface of water. The water slowly dries up. This is called evaporation. The liquid water changes to a gas called water vapour.

When we heat water, the heat gives the water extra energy. The water particles move faster and spread out. When the water is very hot the particles escape very quickly. You can see bubbles forming inside the water. When this happens the water is boiling. This very hot water vapour is called steam.

Class activity  Keep ice cubes cool
Page 28
How will I keep my results tidy?
Students should state that they will use a results table and also graphs to help keep their results tidy.

What do I want to find out?
They should have a clear idea of what they want to find out. For example, will doing X slow down the melting of the ice cube?

What is my prediction?
Students’ predictions should be based on prior knowledge and understanding and include a reason. For example, covering the ice cube with layers of fabric will slow down melting because the fabric will insulate it from the warmth of the room.

What will I do?
In the example above, students should plan to compare covered and uncovered ice cubes. This can be done by measuring mass every few minutes, collecting drips and working out volume or timing how long it takes ice cubes to melt completely. Safety issues involve not tasting any of the water and not spilling water or dropping apparatus.

What can I conclude from the investigation?
Students should discover that insulating ice cubes does slow down melting. They may also have looked at volume – with one large ice cube melting slower than many smaller ones that add up to the same volume. To make investigations more accurate, students should always consider repeating tests to check errors in measurement.

What will I need? Students will need a top pan balance or scales, measuring cylinder, thermometer, fabric and large and small ice cubes.

Students measurements will vary depending on the question they are investigating, but they should all appreciate that they should only change one factor (the independent variable), measure one more (the dependent variable) and keep all other factors the same (the control variables).

Melting and freezing

Home learning  Melting and freezing at home
Page 29

Possible answers:

<table>
<thead>
<tr>
<th>Change of state</th>
<th>Some examples I have seen at home</th>
<th>A drawing of one example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling</td>
<td>Water boiling for cooking or hot drinks</td>
<td>Kettle boiling</td>
</tr>
<tr>
<td>Condensation</td>
<td>Water condensing on cold taps in a kitchen or bathroom and droplets of water condensing on the side of a cold drink</td>
<td></td>
</tr>
<tr>
<td>Melting</td>
<td>Melting chocolate for cooking, a melting ice cream or ice cube melting in a drink</td>
<td></td>
</tr>
<tr>
<td>Freezing</td>
<td>Making ice cubes or ice cream, freezing foods or chocolate setting in cooking</td>
<td></td>
</tr>
</tbody>
</table>

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Home learning  Melting and freezing points  
Page 30

1 The freezing mixture (ice and salt).
2 The warm water in the beaker.
3 The temperature should be 0°C for pure water.
4 The temperature should be 0°C.
5 Yes
6 Yes
7 To reduce errors and mistakes and to be able to calculate a mean (average) for results.

Investigating steam

Class activity  Problems with steam  
Page 31

Examples of steam being used: steam engines in trains and in factories, steam turbines in power stations and steam cleaning.

Students should consider the advantages and problems of using coal and be aware of the need for fossil fuels in many parts of the world. Students should also recognise the need to reduce their use due to environmental and health problems.

Class activity  Changes of state and the weather  
Page 32

The change from solid to liquid is called **melting**.
The change from liquid to gas is called **evaporation**.
The change from liquid to solid is called **freezing**.
The change from gas to liquid is called **condensation**.

<table>
<thead>
<tr>
<th>State of matter</th>
<th>Characteristics</th>
<th>Examples</th>
<th>How the particles are arranged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>No fixed volume, no fixed shape (takes the shape of the container), not dense, flows and easy to squash.</td>
<td>Air, cooking gases, bubbles in fizzy drinks, steam</td>
<td>Particles very far apart and moving very fast</td>
</tr>
<tr>
<td>Liquid</td>
<td>Fixed volume, no fixed shape, dense, hard to squash, flows</td>
<td>Water, fruit juices, petrol, diesel, paraffin</td>
<td>Particles close together, but can move a small amount</td>
</tr>
<tr>
<td>Solid</td>
<td>Fixed volume, fixed shape, very dense, hard to squash, does not flow</td>
<td>Brick, bone, stone, wood, ceramic (pot), metal, plastic</td>
<td>Particles closely packed together. They do not move very much</td>
</tr>
</tbody>
</table>

What we have learned about solids, liquids and gases

Module 3 How Magnets Work

May the force be with you!

Class activity  Buried treasure  
Page 36

The magnet did not pick up the objects because they were not magnetic, for example, steel or iron based.
Possible answers:

<table>
<thead>
<tr>
<th>Objects found with the magnet</th>
<th>Objects not found with the magnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paperclips, pins, drawing pins, ball bearings, metal parts of a toy or small metal toys</td>
<td>Plastic paperclips, elastic bands, wooden spatula, pebbles, plastic, fabric or wooden toys</td>
</tr>
</tbody>
</table>

Home learning  Design a recycling plant  
Page 37

Students should use a magnet and some method of moving the objects below or in front of it. The magnetic objects will be attracted to the magnet and the non-magnetic materials remain on the surface and can be pushed into the bin.

Home learning  Why does the Earth have a North Pole and a South Pole?  
Page 38

At the centre of the Earth there is a liquid core. The core is made of molten metals that are magnetic. It creates a massive magnetic pulling force at each end.

This force wraps around the surface and creates the Earth’s magnetic field with a North end and a South end. The North end of a bar magnet is attracted to the North Pole. The South end of a bar magnet is attracted to the South Pole.

Students’ diagrams should be labelled as shown below.

Class activity  How do magnets react together?  
Page 39

Students may name any of the following pieces of measuring equipment: ruler, tape, meter stick, trundle wheel, scales, top pan balance, forcemeter, measuring jug.

Possible example:

<table>
<thead>
<tr>
<th>Position of magnets</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>North facing South</td>
<td>Opposite ends of the magnets are attracted</td>
</tr>
<tr>
<td>North facing North</td>
<td>The ends will repel or push apart</td>
</tr>
<tr>
<td>South facing South</td>
<td>The ends will repel or push apart</td>
</tr>
<tr>
<td>South facing North</td>
<td>Opposite ends of the magnets are attracted</td>
</tr>
</tbody>
</table>

Home learning  Magic magnets  
Page 40

Students could construct their track in a similar way to the picture.

Home learning  Floating paperclips  
Page 41

The iron in the steel paperclip is magnetic. This is attracted to the magnet and the force of attraction makes the paperclip appear to float.

Which things are magnetic?

Class activity  Strength of magnets  
Page 42

Students should circle ‘Yes’ for each of the three questions.

Not all of the magnets are the same strength.

Home learning  A display of magnetic and non-magnetic materials  
Page 43

Possible objects made out of magnetic materials: paperclip, nail, pin or steel toy car.
Possible objects made out of non-magnetic materials: plastic paperclip, wooden block or plastic toy car.

Home learning  Magnetic metals  
Page 44

Iron, cobalt and nickel are the only magnetic metals that we know of on Earth.

Iron is the most common magnetic metal. Nickel is quite common, but cobalt is very rare.

Many metal objects are made from steel. Steel is a mixture of metals. It is mainly made from iron.
with some nickel. Metals that are mixed with other metals are called **alloys**. Steel is an alloy of **iron**.

No

To magnetise a steel object, such as a nail or pin, stroke it with a magnet in one direction. Repeat this 50 to 100 times.

**Class activity**  My fridge magnet design

**Page 45**

Accept any reasonable design that is the right size to be supported by a small magnet.

**Home learning**  Survey of magnets

**Page 46**

**Possible answers:**

<table>
<thead>
<tr>
<th>Object found</th>
<th>Use of magnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compass</td>
<td>To direct</td>
</tr>
<tr>
<td>Speakers</td>
<td>To create vibrations/sound</td>
</tr>
<tr>
<td>Fridge magnets</td>
<td>To decorate fridges</td>
</tr>
<tr>
<td>Door catches</td>
<td>To help doors close and stay closed</td>
</tr>
</tbody>
</table>

**What we have learned about how magnets work**

**Home learning**  What I have learned...

**Page 47**

The revealed word is ‘attract’.

**Module 4 Habitats**

**Investigating habitats**

**Class activity**  Mini-quadrats

**Page 50**

Quadrats are not very useful for counting living things that move quickly because they can enter and leave the quadrat and confuse the counting.

Students should design a way of placing quadrats by compiling a grid of squares and selecting squares at random, e.g. drawing grid numbers out of a hat.

The numbers of each ‘living thing’ they find will depend on what you have added to the sand, but ensure a mixture and try to have up to 10 of one example.

**Home learning**  Investigate a habitat in the local environment

**Page 51**

Students should find a range of living things using their quadrats at home. They should place the quadrats down four or five times in each location. There is a law of diminishing returns with quadrats, so doing many more will not add significantly to the total counts. Students should have noted the location, equipment used (for example, hand lenses and identification books as well as the quadrat) and the number and types of living things found in the three locations.

**Home learning**  Making sense of data

**Page 52**

Type of living thing

<table>
<thead>
<tr>
<th>Type of living thing</th>
<th>Number of living things found</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beetles</td>
<td>16</td>
</tr>
<tr>
<td>Ants</td>
<td>20</td>
</tr>
<tr>
<td>Caterpillars</td>
<td>8</td>
</tr>
<tr>
<td>Small flowers</td>
<td>12</td>
</tr>
<tr>
<td>Birds</td>
<td>4</td>
</tr>
</tbody>
</table>

**1** Quadrats

**2** Transect

Most common animal: ants.

**Home learning**  Design your own animal

**Page 53**
Students can design many different animals: bird-like, fish-like, mammal-like, for example. However, they should consider:

- insulation from the cold, for example, thick fur, feathers, layer of fat (blubber)
- a way of moving to catch prey, for example, wings, long legs, fins
- a way of catching and eating prey, for example, sharp teeth, talons or long sharp claws.

A well-designed animal could live near the Arctic, Antarctic or high in mountains if adapted to cold climates.

Class activity  Keeping cool
Page 54

1 Students should suggest areas that are:
- in the shade, possibly near water
- exposed to cooling breezes
- underground.

Students should find that the coolest places are in the water (unless it is shallow and not moving as then it can warm up significantly), under soil or beneath rocks and stones.

Check to see if students correctly predicted the coolest places and see if they have identified any local examples, for example, insects or worms.

Home learning  Adaptations to the environment
Page 55

Students will select a variety of animals, but they should link the shape and characteristics of the animal to its survival in the habitat. For example, fish will have gills, fins and a tail for movement; birds will have wings for flying and adapted beaks and feet.

- Examples of how students keep cool in hot weather: drinking water, selecting cool clothing, staying in the shade and using a fan.
- Examples of how students keep warm in colder weather: wearing thicker clothes and hats, using heating in their house or at school and trying not to get wet.
- Examples of how students keep dry in wet weather: wearing waterproof clothes, using an umbrella and staying indoors.

Identification keys

Home learning  Design a key
Page 56

Example answer:

```
Can it fly?
  Yes
  No
Does it live in water?
  Yes
    Fish
  No
    Does it have fur?
      Yes
        Lion
      No
        Does it have fur?
          Yes
            Butterfly
          No
            Lizard
```

How we affect our world

Class activity  Cleaning up an oil spill
Page 57

The oil destroys the habitat where the birds live. This includes their shelter, food and water. It can also cover their feathers and prevent them from flying or moving around the habitat.

Students could suggest a number of different ways of cleaning up an oil spill. These could include using:

- absorbent materials to mop up the spill, for example, fabric and paper towels
- a beam, such as wooden pencils, as a float to collect the oil and then lift it off the water using droppers
- a detergent to disperse the oil.

Home learning  Help your family to manage waste
Page 58

Students’ designs for the sticker should be clearly visible and eye-catching. They should contain information about the need to manage waste responsibly and must include the words ‘recycle’, ‘reuse’ and ‘reduce’.

Students could make containers for jewellery, pencils and everyday items from cardboard tubes and packaging. Plastic bottles...
can be cut up and used to store magazines and small items.

**Home learning**  **Ash from volcanoes**  
*Page 59*

![Volcano Diagram](image)

A volcano produces ash and lava when the magma is forced up the vent very quickly. When the lava erupts, it can blow out ash.

Problems caused by ash include blocking roads and rivers, damage to plants and other living things. The ash can damage human health, such as lung problems, and cause acid rain.

**Class activity**  **Earthquake-proof buildings**  
*Page 60*

Students should discover that buildings with a wide base and strong structure are more likely to withstand the forces of an earthquake better than flimsy, tall and narrow buildings. However, if the building has some flexibility so it can bend as it shakes, this can also be helpful.

**What we have learned about habitats**

**Home activity**  **What I have learned...**  
*Page 61*

1. habitat
2. pooter
3. sweep net
4. quadrat
5. has fur and thick fat
6. camel
7. key
8. oil
9. a giant wave
10. lava
11. air pollution
12. car crashes

**Module 5 Making Circuits**

**Introduction to the module**

**Home learning**  **Electric light survey**  
*Page 64*

Example answer:

<table>
<thead>
<tr>
<th>Room</th>
<th>Number of lights</th>
<th>Types of lights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td>Possibly 4</td>
<td>Spotlights/striplights/light on extractor/oven light</td>
</tr>
<tr>
<td>Dining</td>
<td>Possibly 2</td>
<td>Lamps/ceiling light/spotlights</td>
</tr>
<tr>
<td>Lounge</td>
<td>Possibly 4</td>
<td>Lamps/ceiling light/spotlights/picture lights</td>
</tr>
<tr>
<td>Bedroom</td>
<td>Possibly 2</td>
<td>Ceiling light/bedside lamp</td>
</tr>
<tr>
<td>Bathroom</td>
<td>Possibly 4</td>
<td>Spotlights/ceiling light/mirror light</td>
</tr>
</tbody>
</table>

The kitchen or bathroom will probably have more lights to enable people to see when preparing food and in the bathroom shaving, brushing teeth and applying makeup.

**Constructing circuits**

**Class activity**  **Make and test predictions**  
*Page 65*

1. Components: battery, lamp, wire, connectors.
2. Students’ predictions may be that the lamp will light because the circuit will be complete.
3. Students’ diagrams should be similar to the...
Students’ predictions will probably be correct if the set up is good.

Class activity  Make coloured lights
Page 66
Safety: If the torch is left on too long, the material may overheat and catch fire. This is why you should never cover lamps with a material at home.

Home learning  Lights used as decorations
Page 67
Students may have seen fairy lights at celebrations, in outdoor areas or in shops.
Students may have seen fairy lights on trees and neon lights on advertising boards or on public buildings.
Students could draw a picture of any of the above ideas or their own.

Class activity  Using electricity safely
Page 68
Batteries have a much lower voltage than mains electricity. The force of the electricity in a circuit is measured in volts. In most countries mains electricity has a voltage of between 220 and 240 volts.
The voltage of a battery is much lower than 240 volts. This means batteries are much safer to use.
The plastic part of a plug stops electricity flowing into us. Always hold this part when you are plugging or unplugging appliances. Wires are also covered in plastic to stop electricity flowing through us. If you see a break in the covering you should not use the appliance.
Words and number not used: bulbs, switches, 260.

Home learning  Keeping safe at home
Page 69
Any of the information on page 102 of Stage 4 Student Book 4 from the safety boxes and symbols.
Students may choose to put safety signs in the kitchen or living room.

Break in the circuit

Class activity  Plan to make a switch
Page 70
Students are trying to find out how a switch works.
Students may predict that the lamp in the circuit will light when the switch is closed.
The reason for this could be that the circuit is complete. Electricity can flow through the paperclip to the other fastener to complete the circuit.
Plan the investigation Students will need: cardboard, two brass fasteners, paperclip, battery, wires, lamp.
What students will change: the position of the paperclip.
What students will keep the same: everything else.
What students will observe: whether or not the bulb lights.
What students will do: open the switch and observe the bulb, then close the switch and observe again.
How students will keep safe: they will look for broken wires; they must not work with wet hands nor put any other objects into the circuit.

Home learning  Switches survey
Page 71
Students’ answers will vary considerably, but they will find the most switches in rooms where many appliances are used. For example, the kitchen or living area.
Students might find dimmer switches that work using a dial or buttons that push up and down. They may see pull cords in bathrooms.
Students’ drawings will depend on the unusual switches they find.
Module 6 Sound

Sound

Class activity What I would like to learn

- The idea is that students use their three questions to find the information on the Student Book pages.
- The amazing fact is that dolphins hear through their jaws because they have tiny ears.
- Students should recognise that they will be learning about sound.
- Students may recognise any of the images or information on the pages. The other answers will vary according to the individual.

Making and measuring sound

Home learning Compose a tune

- Students should demonstrate how moving their fingers up and down the strings changes the pitch of the note played. They can also explain how plucking the strings harder makes the sound louder.

Home learning Display information about sound

- Students’ charts need to allow for plotting a range of values from 10 to 160.
- Sound will be plotted on the horizontal axis with Sound level (dB) on the vertical.
How does sound travel to our ears?

Home learning Sounds in the home
Page 81
Students may predict the bedroom as being the quietest room.
Students may say that soft furnishings and carpets make this room quieter.
Students may predict the living space as being the noisiest room.
Students may say that people, TV, radio and games make this room noisy.
They will probably find that their predictions are correct as they know their home.
To soundproof the noisy room, students may suggest covering the floors, ceilings, walls and windows in a sound insulation material.

Class activity Use your hearing to identify materials
Page 82
Students’ answers will depend on the materials provided, but pots, pans, plastic chairs, desks, worktops, metal trays or windows could be suggestions.

Home learning Your string telephone
Page 83
1 Students may find that shorter string helps hearing.
2 The string should be tight.
3 Plastic is the best material out of the choices.
4 The size that fits over the ear best will make the hearing better.

Some materials stop sound travelling

Class activity Protecting your ears
Page 84
Suggestions for jobs where workers need to protect their ears: airport workers, factory workers, engineers, mechanics, road workers.
Suggestions for materials that will reduce the sound reaching your ears: fabric, felt, carpet, bubble wrap, paper.
Students could use plastic cups, plastic food containers or plastic bottles cut up for the outer case.
Students’ designs will vary.

Investigating pitch and volume

Home learning Oscilloscopes
Page 85
A 1 and 2
B 3
C 2 and 3
D 1

Class activity We all hear sounds differently
Page 86
People hear sounds differently. Some people have hearing difficulties in one or both of their ears. This makes them hear things differently to others.
Home learning  Super hearing at home
Page 87
The ear cone focuses the sound to the ear and on to the ear drum. The more vibrations that arrive at the ear drum the more the sound is picked up.

Making music
Home learning  Making music
Page 88
No student answers as these are instructions to make bottle instruments.

What we have learned about sound
Home activity  What I have learned...
Page 89
Students’ own answers.

Quiz yourself
Page 90
1  Skeleton and Muscles

<table>
<thead>
<tr>
<th>Bone</th>
<th>Where is it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tibia</td>
<td>Lower leg</td>
</tr>
<tr>
<td>Patella</td>
<td>Knee</td>
</tr>
<tr>
<td>Humerus</td>
<td>Upper arm</td>
</tr>
<tr>
<td>Pelvis</td>
<td>Lower body</td>
</tr>
<tr>
<td>Radius</td>
<td>Forearm</td>
</tr>
<tr>
<td>Femur</td>
<td>Upper leg</td>
</tr>
<tr>
<td>Ulna</td>
<td>Lower arm</td>
</tr>
</tbody>
</table>

2  Solids, Liquids and Gases
Page 92
4  a and b

5  b  liquid, gas
c  solid, liquid
d  liquid, solid

3  How Magnets Work
Page 93
6

7  B  A  D  C
4 Habitats
Page 94

8

Pooter
Quadrat
Sweep net

9 Left-hand images numbered 1–4 top to bottom. Right-hand images labelled A–D top to bottom.
1 D
2 A
3 C
4 B

5 Making Circuits
Page 95

10 a

✓
✓

b Students’ test circuits should be similar to that on page 98 of Stage 4 Student Book.

11 This component makes electrical energy for a circuit: b
This component makes a loud noise: u
This connects the components in a circuit: l
This component is used to complete or break a circuit: b
Highlighted word: bulb

6 Sound
Page 96

12 a

b volume: how loud or quiet a sound is
d pitch: how high or how low a sound is
e decibel: the unit that scientists use to measure sound

13 a

b Sound level of a whisper: 20 dB
Loudest sound: 160 dB (noise that causes permanent damage to the ear)