SCIENCE

PAKISTAN EDITION

Book 2

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fidem
education network

first edition 2014
first impression 2014

ISBN 978-969-9705-41-0

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Acknowledgement
We are thankful to Faiza Asif for her contribution in developing the worksheets and answer keys.

Published by
fidem education network
D-69/1, Block-9, Scheme 5, Clifton, Karachi-75600, Pakistan
Printed at
Yaqeen Art Press (Private) Limited
Plot 150, Sector 23, Korangi Industrial Area, Karachi-74900, Karachi, Pakistan.

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Introduction

This Teachers' Guide has been developed to accompany Our World of Science textbook series. The Guide has particularly been designed with an aim to help you put your valuable class time and resources to the best use.

The detailed lessons plans in this Guide may be used as they are, or followed loosely depending upon your teaching strategies, resources, time allotted to Science at your institution and very importantly, the needs of your students. Remember, these are not the only ways to transmit knowledge; you can come up with your own plans to tailor the activities given in the lessons and divide your time accordingly.

STRUCTURE OF THE TEACHERS' GUIDE

This Guide has been divided broadly into two main sections: Lesson Plans and Worksheets.

Lesson Plans consist of the following key features:

- **Objectives:** Every chapter lists the learning objectives of the lesson which you may refer to before, during, and as you conclude the teaching of the chapter to ensure that you have covered everything.

- **Vocabulary Bank:** The vocabulary bank includes the relevant vocabulary which the students will require to be familiar with. You should encourage them to use it during class discussions. Make sure that you prepare the class softboard with the words displayed prominently. Drill these words daily. You can prepare flashcards or use other techniques like a thematic word wall on the softboard.

- **Lesson:** The detailed procedure of the main teaching of the lessons has been structured in a way to include activities and their variations, multiple teaching strategies, extra information, hands-on activities and crafts to clarify concepts and give ideas a concrete shape. Each lesson is divided into Warm up, Main Lesson and Recap sections. Be judicious in your choice of activities and you can mix and match different sections. The plans may also be used as they are. You may also improvise and contextualize ideas, incorporating them into your own teaching design.

- **Links:** Weblinks to relevant topics have been given to enhance the teaching process for you and to ensure complete understanding of chapters taught.

- **Evaluation:** Evaluation exercises have been included at the end of every lesson to help you assess and ensure how far key objectives for particular teaching session have been met.

- **Safety**

  Specific safety measures have been included with activities in the Guide; however, exercise all necessary caution when conducting hands-on activities.

  Some general ethical and safety precautions:

  - In discussions involving a comparison of physical and cultural characteristics, be careful not to pass judgmental remarks or to let the students pass critical comments. Students come from different backgrounds and have varying intellectual and physical abilities. Similarly, cultural differences like dietary preferences may also vary. Exercise every caution not to offend their sensibilities. Be sure to emphasize that we are all different in our physical attributes, likes/dislikes, etc.

  - Students may have various allergies from plants, animals, and edible items like pollen, dust, cats, and (pea)nuts. Try to find out any such instances from parents or the school nurse well in advance of any demonstration or field exercise.

  - Make sure before tasting anything the students have clean hands.

  - Ensure that students are under proper supervision when taking them four for a visit to the park or to the playground for observation.

  - The students must never look at the Sun directly, or sunlight reflected in a mirror, microscope, or through a hand lens etc. Warn them of permanent damage including blindness.

  - Be careful when handling apparatus: electrical appliances, mercury thermometers, microscopes, glass beakers, test tubes etc.

  - Seeds may be poisonous. Make sure that children do not put them in their mouth.

  - Candles should be supported firmly in their proper holders.

Remember to go through the plans well in advance to make the necessary preparations, especially for topics like plants, the solar system and weather which require ample time to record results intermittently.

Answers to exercises in the textbook have been provided for each chapter.

Worksheets for every lesson are provided at the end of the Guide. Tear out and photocopy the worksheets to use as a reinforcement exercise, homework or for assessment.

TEACHING STRATEGIES

The philosophy behind our books is to break away from the traditional pedagogical practice of lecturing and focusing on a learner-centred approach. Always demonstrate, discuss and then engage the students in reading the text. Do not initiate any lesson by directly reading from the textbook. We particularly emphasize on collaborative learning in the classroom and encourage you to use various cooperative and interactive teaching strategies.

We have taken meticulous care to include a variety of such strategies in our lesson plans. They include:

Pair/Group Work: Students work in pairs to think about work assigned to them and then discuss amongst themselves before sharing with the class. Two approaches for this are:

Think-Pair-Share: Assign the students a particular task or give them a topic/question to think about. In pairs, the pupils will discuss the question or task, and then share their ideas with each other. Finally, the pupils will discuss their answers with the class.

Jigsaw Technique: This cooperative learning approach where pupils teach there group members what they have learnt. It works like this:

a. Form 'home' groups where each member is assigned a different portion of a chapter to read. Also assign each student with a number, for example from 1–4. Each number denotes the portion assigned to them.

b. All students assigned a particular task in their home groups will then form a group with other pupils assigned the same task. For example, all number 1s from their respective home group will come together, as will all number 2s, 3s, and 4s. They will study and discuss the material and become 'experts' in it.

c. Now all the pupils will return to their respective home groups. They will teach each other what they have learnt about the material assigned to them.

d. Your job is to facilitate this process and evaluate what they have learnt by asking them to make a presentation before the class, or by taking a quiz.

Gallery Walk: An excellent way to start/conduct/revise the lesson. Divide the class into at least 3–4 groups. Each group will be assigned a topic, which they will discuss and write the salient points of on a paper/chart and paste it on the wall. Every chart will be pasted in the room far apart, preferably on all four corners of the room, like an art gallery. Each group will now be stationed in front of another group's poster.

The students in the group will read and discuss the points on the poster and write their observations on sticky notes which they will stick onto the poster. When the teacher claps or rings a bell, each group will rotate and move to the next poster and do the same. All groups will rotate in this manner until each group has had a chance to look at every group's poster. All the groups will then end when they have reached their own group's poster.

Loop cards: This is a popular educational game to keep students actively engaged. Prepare cards with a question on one side and answer on the other. The answer should be to a different question and not the one on the card. The number of cards you prepare should match the number of students in the class.

Distribute the cards, giving one card to each pupil. Begin by one student reading aloud the question on his/her card. The rest of their students will flip their cards to see who has the answer. The child bearing the correct answer will call out the answer and then it will be his her turn to read out the question on his/her card.

If the child with the correct answer written on his/her card does not know that it is the answer to the question, whoever answers correctly will be the next to read out the question on his/her card. The students can be divided into teams as well.

Loop cards can serve as an excellent revision/evaluation strategy. It keeps the students thoroughly attentive because the card they hold may come up in the loop. The idea is to have all the children participate by asking and answering questions in a way that you come back in a loop to the 'Start' person.

KWL: This is a comprehension strategy to evaluate what the students have learned using a chart. You can make a three column table on the board or a flip chart labelled K, W and L. Before reading, first find out what the children already know about a topic (K). List those points on the flip chart. Then ask what they want to know about the topic (W). List these as well. After the reading and discussion, ask what they have learned about the topic (L). Once you have completed the chart, analyse it to see

what learning has taken place. KWL gives the students a purpose for learning the topic and keeps them engaged.

Here is what the KWL chart may look like:

K What I/we know	W What I/we want to know	L What I/we learned
Write the what the students already know in this column	Write what the students want to know in this column	After the completion of the lesson write whatever the students have learned in this column

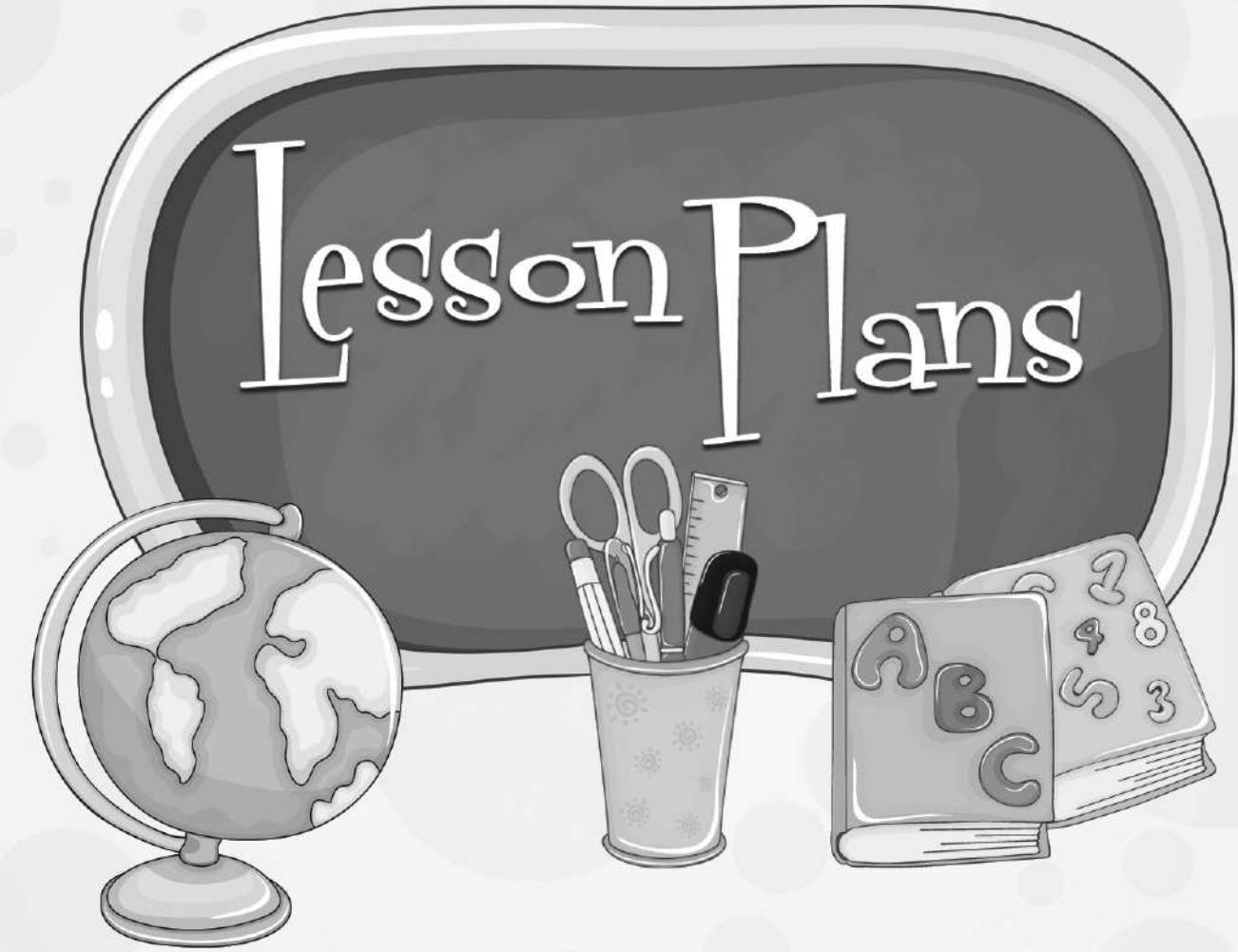
Circle Time: This is an excellent strategy to initiate discussions or use as part of your main lesson. Arrange the class in a fish bowl set-up or if there is enough room, ask them to sit in a large circle. This allows face to face interaction and helps in exchange of ideas, revision, and removal of misconceptions. This may be used in conjunction with any of the strategies above, for example the gallery walk. Each group can read out the comments left by other groups on their posters, leading to an interactive discussion.

Audio Visual Aids: Links to relevant websites have been provided in the lesson plans for different topics. Concepts are understood best only when they are seen or done practically. The children must experience phenomena in order to fully understand concepts like forces, electricity, materials, living things, etc.

Although every care has been taken to ensure that the lesson plans in this Guide will help facilitate learning through inquiry and practical activities, they are not necessarily to be followed rigidly. If you have trouble arranging the required resources for a lesson, feel free to improvise. Make the most of what you have readily available.

Science started with observation, and this is one of the first skills to be inculcated in children to foster the spirit of scientific enquiry, followed by collecting information, inference, experimentation, recording and analysing results to form a conclusion. A good teacher always tries to provide a variety of learning experiences to the students. Make every effort to connect phenomena to the experiences of the everyday lives of your learners. Take them to the playground or a nearby park, the music room, computer room, or any other place to engage them in a hands-on learning experience, encouraging them to observe and ponder over their findings.

Lesson Plans



Unit 1

Chapter 1

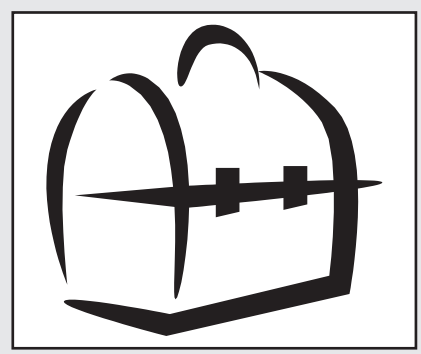
Staying healthy

Objectives	By the end of the chapter, students should be able to: • understand that humans need water and food to stay alive • record information in drawing and charts • identify that there are many different foods • understand that we must eat different kinds of food to grow well and stay healthy • become aware that exercise, rest, sleep, good hygiene and proper clothing ,according to each season, are all important for staying healthy and disease free • collect information and to present results as a block graph • realize sometimes we eat a lot of some foods and not very much of others • make and record observations and make simple comparisons
Vocabulary Bank	healthy, energy, exercise, rest, tidy, clean, balanced diet, food groups, dairy, proteins, grains, fruits, vegetables, diet food, fatty, sugary, oily, fried, boiled, steamed, junk food; lazy, dull, active, energetic, junk food

LESSON 1: 40 mins

5 mins	**Warm up:** Elicit previous knowledge with a discussion. Show them pictures of a personal computer, car, air conditioner. Ask them to name the objects. *The computer, like your car, motorbike, or air conditioner is a machine.* Now ask what would happen if you did not take care of any of these machines, by cleaning them and having them checked regularly for gas, oil, etc. to make sure that all their parts function properly. They would not perform their task properly and breakdown. Similarly, our body is like a machine, which has many different functions to perform. *Like a machine, its parts need care and maintenance. How can you keep your body healthy? We need to eat well and drink lots of water.* Now ask them what else is required for them other than food and drink to remain healthy. *We should exercise daily and remain neat and clean to be healthy and strong.*

30 mins	**Main Lesson:** Tell the students that you are going to tell them a story about a young boy. This is a page from his diary: *I woke up at 7 o'clock in the morning. I had slept late the night before, and felt very sleepy. I finally got up and washed my face and rinsed my mouth. I did not want to brush my teeth. Mummy prepared breakfast but I did not have enough time to eat as the school bus had arrived. At school we had a surprise nail check. My nails were long and had dirt in them.* *When I finally came home after a long, hot day at school, Mummy told me to take a bath before having lunch. I hate taking baths, besides, my favourite cartoon show was about to start so I could not waste time bathing. I didn't want to eat the chicken and vegetable meal she had prepared. Therefore, I just had a packet of chips without washing my hands. After the show, I went out to play football with my little brother. At 5 o'clock, I sat down to do my homework, but I was so tired that I fell asleep. When Papa came home in the evening, he took us out for ice cream. We stopped at the park on the way back and it was late when we returned home. I was so sleepy that I didn't change my clothes or brush my teeth. It will be very hard for me to get up in the morning…* As you read, ask the children to identify the unhealthy habits this boy has. Emphasize that rest, play and work are all important if they are in balance, and too much of any of them harms our health and body. Now read pages 8-12 and discuss the pictures. OR It may be useful to tie the lesson about exercise to a P.E. or games lesson, so that pupils can try an activity and then describe how it makes them feel. Help them identify differences by asking questions such as: *Were you hotter after P.E. or sports period? Do you feel very tired after swimming? Do you feel thirsty after running a race? Do you feel active or dull after exercise?* Help children realize that being well and feeling good is what being healthy means and that regular exercise contributes to this. Our food, or diet, is also very important for our health. Provide the students with a number of opportunities to research about the various food choices they come across each day. Let children carry out a survey of the foods available in the school canteen and those most liked by children. Help them categorize the available foods as healthy or unhealthy and present results of food survey as a block graph and say what this shows e.g. *the food most children like best is chocolate etc.* A very useful link for teachers to use with their pupils while teaching about health is http://kidshealth.org
5 mins	**Recap:** Review the lesson by asking the children to act out a way out of keeping themselves healthy, and the other children can guess.

5 mins	**Warm up:** Review that food, water, rest, exercise, hygiene are all important for us to remain healthy. Ask the students what they have inside their lunchboxes today. Write their answers on the board. Now make two columns on the board and write 'Healthy' and 'Unhealthy'. Show them pictures of different foods, including everyday food, party food, and foods eaten on festivals, Ask students to name foods which they think are healthy or unhealthy. Write the names on the board. *Do you have pizza every day? Which of these do you eat daily? Which do you at sometimes?* Explain that unhealthy food should be taken sometimes and in moderation.
30 mins	**Main Lesson:** Explain that food is normally divided into 5 main food groups. Show them an already prepared food group pyramid chart. We should have a balanced diet. Read pages 10–12. Ask the students how often they have food from the different groups. *Who drinks milk every day? Do you eat bread daily? Make sure that you eat a variety of fruits.* Explain that occasional treats are all right but you cannot indulge in party food every day. We need water and a variety of foods regularly in our diet. Talk with the children about the effects of not eating or not eating a variety of foods in terms of not growing well.
	The children will cut and paste the picture of the lunchbox below in their notebooks. Now they will make labels and write a few healthy foods and drinks that they will add into their lunchbox. Talk with the children about the effects of not eating or not eating a variety of foods in terms of not growing well.  The following is a good activity to help students understand the effects on not receiving adequate food, water, rest and exercise: http://www.bbc.co.uk/schools/scienceclips/ages/6_7/health_growth.shtml Exercises 1 and 2 will be done in class.

5 mins	**Recap**: The students will share their lunch menu prepared in the activity with the class. Review the main points.
	Evaluation: Worksheet **Staying Healthy** can be given to evaluate the students.
	Safety: 1. Even if it is not intended that children should taste foods some may try to do so. Good hygiene is therefore important or the foods should be made inaccessible. 2. Children should undertake usual P.E. activities, not attempt to 'test' their stamina or strength.

Answers

Exercise – 1

a. We must stay healthy to remain strong and free from disease.

b. We should:

- Rest and relax
- Be clean and tidy
- Play and exercise
- Eat healthy food
- Get enough sleep

c. Food helps us to grow; it also gives us energy and makes us strong.

d. Meat from animals and fish, egg from birds, soya beans and peanuts.

e. Fruits and vegetables help develop our taste and also protect our body in many ways. They provide important nutrients for our body.

f. It is important to take care of ourselves to stay healthy. We will also be less likely to fall ill.

g. Fizzy drinks, oily food and sweets should not be taken frequently.

Exercise – 2

1. b 2. b 3. a 4. b 5. c

Chapter 2

Unit 1

Growth

Objectives	By the end of the lesson, students should be able to: • realize that living things grow and non-living things expand • understand that living things grow by making new parts and changing • observe that many body parts change, become larger in size or disappear completely as a living thing grows • understand that water, food, exercise and rest needed for growth • recognize that all animals and humans produce young and these grow into adults • observe and identify the similarities and differences between adult animals and their babies • recognize the need for animal parents protect (take care of) their babies • learn that human babies and very young children need to be looked after just like animal babies
Vocabulary Bank	grow, change, develop, cocoon, lazy, dull, active, energetic, tiny, bigger, disappeared, similar, different, protect (take care of), healthy food, water, rest, predators, prey, species, extinct

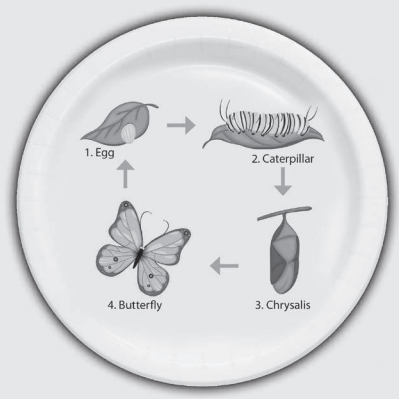
LESSON 1: 40 mins

5 mins	**Warm up:** Show the children a photo of a chick, duckling, cub, kitten and puppy, a human baby, a small plant. Ask them what each one will grow into. Now show them a balloon. Blow it and ask the students what has happened to it. Explain that it has grown larger in size. Explain that in Science, we say that it has not really grown, but it has expanded, as growth means changing of living things in certain special ways. Plants also grow. You may wish to help them recall the seed sprouting projects they did in Class1. Likewise, animals and humans also grow.

30 mins	**Main Lesson:** Explain that the various stages of growth and change in the life of an animal, plant or human. Explain that for many animals, babies are miniature versions of their parents: they have the same general appearance but they are smaller in size. Look at the pictures on page 20 and 21. Explain the life cycle of a frog. As the babies grow into adults, many animals keep the same features. But for some animals, this is not the case e.g. *frogs aren't born with their adult features -- they are born as tadpoles without legs and as time goes on their body develops and legs grow.* Discuss the plant life cycle. A seed is sown in the soil and it grows in size. It develops a shoot and roots. The stem develops further to produce leaves and sometimes flowers. The life cycle of a butterfly is the most interesting. A caterpillar develops into a butterfly. Explain the life cycle through this wonderful link: http://www.thebutterflysite.com/life-cycle.shtml It shows each of the four stages of the life cycle in detail and with short animations, as well as a colouring page.
5 min	**Recap:** Review the main points of the lesson. All living things grow and change. Some grow and develop to look like their parents, especially plants and animals. Human babies have the same basic body parts, but their faces are not exactly the same as their parents.

LESSON 2: 40 mins

5 mins	**Warm up:** This lesson will focus on how animal and human parents care for their young. Begin the lesson by prompting with relevant questions. *When you were babies, could you take care of yourselves? As you have grown older, who looks after you now?* Parents care for their babies. Assess what the children know about caring for babies and young children. Find out what they know about the importance of regular medical check-ups to stay healthy. Incorporate the missing points in your discussion.

30 mins	**Main Lesson:** Can you describe ways in which humans care for their young? They provide their children with food, shelter, and other necessities, teach them how to walk, talk, provide protection, love and care. Now show them the pictures of animals with their young. E.g. cat and kittens, koala bear and its young, birds and their young in a nest, hen and its chicks, etc. Adult animals also care for their young. How? They provide them with food, shelter, protection, and teach them how to survive by hunting for their food, flying, moving, and fighting against predators. If adult animals and humans will not take care of their young, their species will be in danger and would die, or become extinct. A very useful link for teachers to use with their pupils while teaching about animal parents caring for their babies is http://activities.macmillanmh.com/OralLanguageActivities/main1.php?selectionID=212 Exercises 1 and 2 page 24 and 25 will be done in class. Use Exercise 1 to match parent and offspring and explain that all animals produce young.
5 mins	**Recap:** Review that when we are born until we become old enough to do things by ourselves, adults take care of us to make sure that we remain safe and healthy, and learn ways to make it easy for us to live a normal life. Discuss the importance of caring for the babies for the survival of the species in simple terms *Animals also care for their young. A species would die if its young are not cared for properly.*
	Evaluation: The worksheet **Growth** may be given to evaluate the students.
	Extension: • Let's Find Out for Ourselves page 23 can be given as a home activity. • The children will work in pairs and make the following craft: https://www.scholastic.com/teachers/article/butterfly-life-cycle-plate-craft You can improvise and use other items like *daal*, crepe paper, beads, etc. and punch a hole and hang these plates in class. 

Answers

Exercise – 2

a. change

b. grow

c. cat

d. seeds

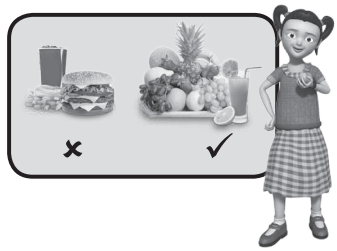
e. look

f. take care

Unit 1

Chapter 3

Medicines and safety



Objectives	By the end of the lesson, the students should be able to: • know that sometimes we take medicines when we get ill, these help us to get better • understand that although medicines may be useful, they are drugs not food, and can be dangerous • realize that some people need medicines to keep them alive and healthy • ask questions about medicines and health • realize medicines can be dangerous if we take them without consulting parents or doctors • recognize hazards and risks in medicines and how to avoid these • collect, observe and compare packaging of medicines • record information in drawing and tables
Vocabulary Bank	dangerous, safety, medicine, drugs, instructions, advice, warning, vaccines, injections

LESSON 1: 40 mins

5 mins	**Warm Up:** Review the healthy habits studied in Chapter 1. Although we may have healthy habits, we may fall ill. Ask the children if they have ever taken medicines. *Why? Were all the medicines liquids (syrups)? Were some tablets?* What about polio drops and other injections?
30 mins	**Main Lesson:** Explain that we all take medicines when we are ill. *Medicines fight germs in our body, and help us get better.* But medicines should be given to us by the doctor, because every disease is different and the doctor knows which medicine will cure which illness. When the doctor tells us which medicine to take, it is called a **prescription**.

	Most medicines have a warning, a sentence that says "Keep all medicines out of the reach of children". *Do you know why? Medicines can be extremely dangerous if they are taken without a prescription.* *We should never take medicines unless the doctor prescribes them for us.* Ask the students to collect packages of medicines and bring them to the next lesson. Tell them that sometimes medicines need to be taken by very old people or people who suffer from certain diseases, like diabetes or what we call 'sugar'. This is when the body stops controlling the level of sugar in our blood. We than have to take medicines or injections of a medicine called insulin to control it. Look at and discuss the pictures on page 28. Ask if they know anyone who uses an inhaler or if they have elders in their family who must take medicines daily to keep healthy. *We also have medicines at home for general use, for example Panadol, and anti allergy medicines, but these also should be given by an adult and NEVER taken by ourselves. These medicines are for emergency situations where an injury has to be treated very quickly before the doctor arrives. We call this first aid. We also have medical items like bandages, cotton wool, and disinfectants like Dettol.* Read page 29 and do Exercises 1 and 2 in class.
5 mins	Recap: Review the lesson. *We take medicines to make us feel better when we fall ill. We have some medicines at home for injuries which need immediate treatment. We must not take any medicines by ourselves or eat them because they are very dangerous.*
	Safety: Warn children that medicines are dangerous if taken without the knowledge of parents/doctors. If medicines are brought in for demonstration purposes keep them out of childrens' reach

LESSON 2: 40 + 40 mins

5 mins	Warm up: We need to take care of ourselves and adopt healthy habits to prevent falling ill. *What can we do to prevent germs from harming us?* Note their answers and write them on the board.
65 mins	Main Lesson: Read page 30 together. As you read, stop and discuss the pictures. Make groups of four and give each group a sheet of coloured chart paper. Draw an outline of a human body on the chart papers.

	Now, write the title HEALTHY ME and ask them to brainstorm ways to keep themselves clean, healthy and free from illnesses e.g. covering your mouth when coughing or sneezing, washing your hands before meals and after touching currency notes, throwing away used tissue paper, having ourselves treated by a doctor and not taking medicines ourselves, etc. The children can draw pictures, stick items on (medicine wrappers, tissue paper, bandages, etc) or write in words. The posters will be presented before the class.
10 mins	**Recap:** Review that we must keep ourselves and our surroundings clean in order to reduce the risk of falling ill. Ask them to write down three ways each for keeping ourselves and our surroundings clean.
	Evaluation Exercises 3 and 4 or the worksheet **Medicines and Safety** can also be given to evaluate the students.

Answers

Exercise – 1

a. True b. True c. False d. True e. False f. False

Exercise – 3

a. Medicines fight against germs and prevent them from causing harm. They also cure illnesses and makes us fit again.

b. The doctor prescribes the right medicine for us.

c. During an illness we are not able to work properly and have fun. We see a doctor when we fell sick and he can easily find out and tell us about any illness or sickness.

d. By keeping ourselves and our surroundings clean we can keep ourselves safe and protected from being infected by illnesses. (give specific examples)

e. • Pollution • Laziness • Unhealthy • diet • Addiction to fun/entertainment devices

f. Immediate treatment provided after injury is called first aid.

Exercise – 4

1. b 2. a 3. b 4. a 5. a

Chapter 4

Unit 2

Habitats

Objectives	By the end of the lesson, the students should be able to: • understand that a habitat is a place where a collection of plants and animals live and which provides them with food and shelter • name and identify some common habitats such as seashores, gardens, ponds, jungles, deserts are all examples of habitats • recognize habitats can be large or small • understand plants and animals often have to adapt, or change in order to survive • realize that living things are suited to their habitat • realize that a habitat can harm the animals and plants living there • observe and identify features of a habitat and specific animals through pictures and habitats and then use these to deduce how they are suited to each other • name some common animals and plants found in the local habitat
Vocabulary Bank	habitat, land, air, water desert, jungles, rainforests, arctic, tundra, lake, pond, hedge, flower, bed, trees, nests, camouflage

LESSON 1: 40 mins

5 mins	**Warm up:** Introduce the topic by taking the class into the school garden or playground. (Children may not expect to find any animals in the immediate locality of the school. It is sometimes helpful to make sure there are flower pots, stones or logs in suitable places near to the school a few days before this activity.) Ask the pupils to note what living things they can see in the air and on the ground, e.g. trees, flowers, grass, ants, beetles, worms, caterpillars, squirrels, cats, birds, flies, bees .etc (Children may need to be reminded about not disturbing the animals they find.)

Explore areas between pavements, underside of broad leaves, underneath plant pots, damp and shady areas like under a pile of wet leaves etc. Ask them to name few plants and animals that they may find in their local environment outside the school. Use this opportunity to explain that differences between places very close to each other result in a different range of plants and animals being found.

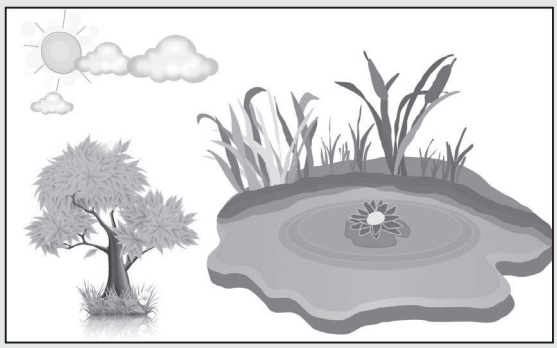
OR

Show flashcards with pictures of different animals. Ask them if the animal lives on land, air, or water. Show them the cards and ask them if the animal lives on land, air or in water.

30 mins

Main Lesson:

Return to the class and recap with the children what they saw.



You can paste a chart on the board with a picture of the land, air and water.

Ask what they saw when they looked up in the air. What did they see when looked down on the ground? Ask what they may see in water.

As the children respond, write their answer on a piece of masking tape and give it to the child, who will paste the label in the right position on the chart. Some animals may live on both, so two labels should be placed in different places.

OR

Ask them to record in a table like the one below what living things would be found in each of the three areas i.e. ground, air and water. Make it clear that some living things can go in more than one area. For example, the butterfly and the bird can be in the sky or on land. If the bird is a duck, it could also be on water.

Name of animal	Ground	Air	Water
duck	yes		yes
bird	Yes	yes	some (flamingo)

After the discussion introduce the term **habitat**. *A habitat is a place where a living thing lives and has its needs met, such as getting shelter, food, water, and companionship,*

Your home is your habitat. Our homes provide us with comfort, shelter, companionship

	and security. Similarly, for other living things, a habitat is a place where they find their food and shelter. Different living things require different habitats according to their needs. Read pages 36-39 and discuss the pictures. Do exercises 1 and 3. Tell students to find pictures and information of different animals which live in different habitats for the next lesson.
5 mins	**Recap:** Wind up the lesson by reviewing that a habitat is a place where plants and animals live in to fulfill their need of food, shelter, caring for their young, companionship and security. A habitat may be big or small. Animals may have different kinds of homes in a habitat. Also, similar kinds of animals may have a different kind of habitat.

LESSON 2: 40 mins

10 mins	**Warm up:** Ask the students: What is a habitat? A very useful link for teachers to teach about habitats is: http://www.scribd.com/doc/19051488/All-About-Habitats-EBook-for-Kids
25 mins	**Main Lesson:** Use Let's Find Out for Ourselves to compare two or three contrasting habitats. The children may have brought the pictures. If not, they can draw them. Bring reference books from the library to the class. Ask children to describe the different habitats and speculate for the difference in living things found in each of the habitats. Help them figure out the features that help these creatures to be suited to their particular environments.
5 mins	**Recap:** Give an example of a habitat on: 1. Land 2. Water

	Can you give three reasons why animals need habitats? 1. To rest 2. To produce young 3. To care for their young *What can happen if changes happen in an animal's habitat?* *The animals can be harmed and they may find it difficult to survive.*
	Evaluation: Exercise 2 or the worksheet **Habitats** can be given for evaluation.
	Safety: When working out of doors, teachers should check that there is no broken glass etc. Sites unlikely to have been contaminated with animal faeces should be chosen. Ensure that children wear disposable gloves and also wash their hands after handling soil etc.

Answers

Exercise – 1

a. nest b. freshwater c. die d. colour

Exercise – 2

a. A habitat provides food and protection for animals and a place to grow for plants.

b. Animals like a camel which can survive without water for many days are found in a desert.

c. Living things adapt by adjusting themselves to the changing conditions of their environment.

d. They will not be able to adjust and survive, because their habitat will not provide them different needs.

e. Cutting trees, harsh weather conditions, pollution and hunting of animals (so that there is no food/prey for other larger animals) are some of the factors that can change the habitat of animals.

f. Cat, dog, cow, lizard, cockroach etc.

g. It is a warm habitat with flat land, trees and water.

Exercise – 3

1. c 2. b 3. c 4. a 5. a

Unit 2

Chapter 5

Animals

Objectives	By the end of the chapter, students should be able to: • differentiate between vertebrates and invertebrates • recognize basic characteristics of groups of vertebrates • recognize insects and identify their unique characteristics • realize variation in animals based on the habitat they live in • treat animals and the environment with care and sensitivity • identify ways in which the animals are like each other e.g. *they've all got heads, they've all got eyes, they all can move* • identify ways in which the animals are different from each other • group animals according to observable similarities and differences • recognize that animals produce young • know that most babies are very similar to their parents but this is not so for some animals • understand that animals reproduce by laying eggs or producing babies • realize that animals change as they grow older • recognize that animals of the same species show variation in form, structure and ability
Vocabulary Bank	vertebrates, invertebrates, environment, reptiles, mammals, amphibians, birds, fish, insects
Resources	A4 sheets of paper, picture cards of different animals

LESSON 1: 40 mins

15 mins	**Warm up:** The students will work in pairs. Show them the flash cards. Ask the students what their favourite animal is. Can you describe it? Tell them to write about its appearance, body parts, size, way of movement, diet, habitat etc. eg *legs/no legs, fly/walk/slither*

20 mins	**Main Lesson:** Now ask the students to present their work to the class. Ask if it is possible to group these animals based on their similarities. Explain that since all animals vary so much in appearance, body parts, diet, etc that it becomes quite difficult to group them. One very important way animals can be grouped by dividing them into animals with and without a backbone. These are called vertebrates and invertebrates. Referring to the picture cards and the animals the students have chosen, ask which of these animals have a backbone. Most probably, they will all have a backbone. Explain that as animals are so different from one another, vertebrates and invertebrates are further divided into smaller groups. Refer to page 46 and 47 as you discuss this. Briefly explain the basic characteristics of each group of vertebrates: mammals (humans come in this category), reptiles, fish, amphibians, and birds. You can put up a chart on the softboard before the class and point to the characteristics. You can use ideas from the following link: https://hpelementarytechclass.wikispaces.com/07-08+Student+Work Briefly explain the difference between cold-blooded and warm-blooded animals as their body temperatures remaining the same or varying with their surroundings. Explain that insects do not have a backbone and are the largest group of invertebrates. Discuss their features as you look at the pictures on page 48.
5 mins	**Recap:** Review the main points of the lesson. We can group plants and animals based on the similarities they share. *What are the two main ways of grouping animals?* Vertebrates and invertebrates *Can you name the groups of animals that are vertebrates? Mammals, reptile, amphibians, birds, fish,* *Insects are examples of …?* Invertebrates *Can you describe the characteristics of insects?* Eyes, two or no legs, antenna, sounds, lay eggs, short life, they do not rest or play like humans and other animals, many have wings

LESSON 2: 40 mins

10 mins	**Warm up:** Review how we group animals based on their similarities. *Humans and animals are both mammals, yet are all our characteristics the same?* (No, some animals walk on all four legs, humans have a straight back, we have skin and hair, we appear different, we have a different diet,etc) Show the students a picture of a zebra and a giraffe. *Both of these animals are vertebrates. They are mammals. They also live in the same habitat. How are they different? Look at the giraffe. Why do you think it has such a long neck?* Look at the zebra's hoof, coat colour, hair, size, etc. You can use a similar example of a cow and a goat.
25 mins	**Main Lesson:** Animals from the same family, or species, vary in their appearances. *We call this variation.* Discuss by referring to page 49. When animals are born, they may or may not be similar to their parents. However, they look like their parents as they grow and develop. *Some animals lay eggs.* *Others give birth to babies.* Ask the children to describe the changes taking place in the pictures on page 50. Remind them about their previous lesson on how a tadpole changes into a frog. The following link has an activity on grouping and a quiz on variation. It is strongly suggested that the students attempt this activity. http://www.bbc.co.uk/schools/scienceclips/ages/6_7/variation.shtml Another very useful link for teachers to teach about grouping animals and plants is: www.kineticcity.com/mindgames/grinder
5 mins	**Recap:** Do exercise 1 on page 52 to help wind up and consolidate the lesson.
	Evaluation: The worksheet **Animals** may be given to evaluate the students. The following exercise may also be given. 1. What is variation in animals?

	2. What are its advantages for an animal? 3. Give three examples of animals that lay eggs. 4. Give three examples of animals which give birth to babies.
	Extension: Let them put animals into groups based on a single criterion for grouping initially. As children get confident in doing this they may choose more than one criterion for grouping animals. The students can play a game where one child describes the characters of an imaginary animal and the other one draws it on the board. This will encourage them to use the correct vocabulary and it will be fun at the same time. Let's Find Out for Ourselves can be done as a home/library assignment to help clarify the concept of variation.

Answers

Exercise – 1

1. a 2. a 3. a 4. c

Exercise – 2

a. Fish, amphibians, reptiles, birds, mammals.

b. Six legged, eight legged, back shelled, many legged, three bodied.

c. Insects are the oldest living creatures on the planet. Insects have two or more legs; they have few eyes and antenna for communicating. Insects lay eggs. The do not rest or play like humans and animals. They are small in size. They may be dangerous.

d. Animals have different kind of limbs to allow them to move, hunt and adapt to their environment.

e. Shrimp, lobster, crab, octopus, etc. (Answers may vary)

Unit 3

Chapter 6

Plants

Objectives	By the end of the chapter, students should be able to: • recognize that there are two main groups of plants; flowering plants and non-flowering plants • understand that most flowering plants reproduce (grow new plants) by making seeds • understand that most non-flowering plants reproduce by making tiny spores • understand that seeds and fruits come from the flower of a plant. • realize that seeds are usually found inside the fruit • recognize the huge variety of seeds from which plants grow • to use these observations to conclude that plants need water, warmth and light to grow well
Vocabulary Bank	grow, change, develop, fruit, head, pod, seed, tiny, bigger, sprouting, reproduce
Resources	fruits containing seeds (melon, apple, tomato, *cheeko,* orange, etc), bean seed, a small knife

LESSON 1: 40 mins

5 mins	**Warm up:** Begin the lesson by stating that humans, animals and plants are all living things. *What do you know about living things?* *They feed, breathe, eat and drink.* *We have already studied about animals in the last chapter. We will now talk about plants.*

30 mins	**Main Lesson:** Explain that just as we group animals, plants are also grouped together based on their similarities. There are so many similarities and differences amongst plants, that they may be grouped in many different ways. A simple way is by grouping them into flowering and non-flowering plants. Take the children outside to the playground. They will observe plants around them. Ask them to closely observe their different plants. They will look at the activity on page *57* and complete it outside. They will draw pictures of the plants they have observed. They will note: 1. the shape, size and colour of its leaves 2. general appearance and height of the plant, 3. its stem (thick, thin, long, etc) 4. shape, colour and smell of flowers (if present), seeds Back in the classroom, discuss the examples they have drawn. Look at the examples on page *55* and discuss the pictures. *Although a plant may not have flowers, it must have leaves. Leaves are the most important part of a plant. We get food from outside and it is processed in our stomach. We would die without food. Plants also need food to live. But unlike us, plants make their own food. This is made by the leaves. Leaves use sunlight, air and water to make food for the plant. The plant also breathes air with the help of its leaves.* Plants have variation in their leaves as well. Discuss the pictures on page 56. *What were the kinds of leaves that you observed outside?* Help them use descriptive words like flat, long, small, smooth, rough, prickly, furry, with veins, like a pine-tree, like a coconut tree etc.
5 mins	**Recap:** Review the main points of the lesson, particularly the grouping of plants and the importance of leaves.

LESSON 2: 40 mins

5 mins	**Warm up:** Review that plants are living things that breathe, feed and grow. They also produce young plants, just like humans and animals have babies. Introduce the term **reproduce** here.

30 mins	**Main Lesson:** Cut open an apple, showing its seeds, and give it to a group of students to observe. Give other groups a tomato, a *cheeko*, a guava, and some melon, orange and bean seeds. (You may show pictures of these if the fruits are unavailable. Use simple reference books or show children a series of pictures of plants in flower and with fruits.) Let the children examine and describe the seeds and note their number in different fruits. Explain that flowering plants reproduce with the help of seeds. The seed grows into a new plant. The seed has many different sensitive parts inside it, so it is covered by a harder covering on the outside. The flower of the plant produces the seeds, which develop into the fruit. Non-flowering plants do not grow with the help of seeds. They produce **spores** for making new plants. Read pages 55-56 and do Exercises 1 and 2.
5 mins	**Recap:** Ask the children some questions: *How do flowering plants reproduce?* With the help of seeds *How do non flowering plants reproduce?* Spores *Why are flowers important?* They produce the seed and fruits.
	Evaluation: The worksheet **Plants** may be given for evaluation in addition to the activity and quiz on plants and animals in the local environment on the following link: http://www.bbc.co.uk/schools/scienceclips/ages/6_7/plants_animals_env.shtml
	Extension: • A walk round the school or a visit the local park would be useful. This activity will help pupils identify a number of plants in their local environment. E.g. dandelion, daisy, buttercup, rose, oak tree, mango tree, banyan tree. • Help pupils make a collection of seeds and fruits of different shapes and colours e.g. tomato, apple, mango, green pepper, grape, bean pod, seed head from grass. A dry sunflower head is excellent for showing children where the seeds are.

	• You may wish to recall with them the seed sprouting projects they did in Class I. If this unit is taught in the spring, it should be possible to show children shoots of new plants. • If possible, grow a broad bean/pea plant so that children can see the flower and seeds develop. It is helpful if some seeds can be grown in water in transparent containers so that children can see the roots grow. • A very useful link for teachers to use with their pupils to find the names and pictures of common flowers and plants is www.bhg.com/gardening/plant-dictionary/
	Safety 1. Children may be allergic to fruits and seeds, especially peanuts. Avoid red kidney beans. 2. Keep sharp knives away from the reach of children.

Answers

Exercise – 1

a. Flowering plant and non-flowering plant

b. Flowering plants grow flowers and non-flowering plants do not produce flowers.

c. Flowers and fruits

d. Non flowering plants contain spores to grow new plants.

e. Apple, mango, banana, orange etc.

Unit 4

Chapter 7

Water

Objectives	By the end of the chapter, students should be able to: • know that water is very important for all living things • recognize that there are many natural sources of water • identify natural sources of water • identify main sources of water in their locality • understand how water gets from a natural source to taps in their home • list daily activities in which they use water • understand that clean water should be used for drinking • realize that there are some people who always face shortage of water • understand the importance of conserving water • enumerate and present ways of conserving water

LESSON 1: 40 mins

5 mins	**Warm up:** Begin the children by asking them how many different uses of water they can think of. *What do you use water for? Can you name examples from your everyday life?* Write answers like drinking, washing, bathing, cooking etc. on the board.
30 mins	**Main Lesson:** Explain that water is a very important **natural resource**. If we divide the Earth into 3 parts, 2 of these parts are covered by water and only 1 part is land. Ask them if they have ever been to the seaside. *What kind of animals live in water?* The most obvious answer seems to be fish. They may also be able to name whale, shark, crab and lobster. Water is very important for the survival of humans, plants and animals. *Where is water found?* Look at pages 61 and 62 and explain that water is found in the sea, ocean, lakes, rivers, and ponds. *These are natural sources of water.*

	Water can also be obtained through artificial means when we dig very deep holes into the ground. A well is an example. Hand pumps and tube wells are found in agricultural areas and farms. Many of you may have a type of a 'well' in your homes made by a machine which drills or bores a hole very deep into the ground. *Where does the water in your home come from?* Explain that water is supplied into our homes through natural sources. Discuss the pictures at the bottom of page 61.
5 mins	Recap: Water is very important for human, animal and plant life. 2/3 of the Earth is covered by water. We use water for drinking, washing, bathing, cooking etc. Water is supplied to our homes from natural resources.

LESSON 1: 40 mins

5 mins	Warm Up: The water in our homes from taps is not fit to drink. *Do you fill your bottles with the water which comes from the taps in your homes? Do you use that water as it is for drinking?* Note their responses. Many will say that we use filters, boil it first, or order bottles of mineral water. The water needs to be treated before it is made fit for drinking.
30 mins	Main Lesson: Review that two-thirds of the Earth is covered by water. Even then, water is a very precious resource. We must not waste it, as a lot of other resources are required to make this water fit for our use. There are lots of seas, oceans and ponds, yet why do you think it is scarce? Prompt them to think and reach the conclusion that it is dirty or polluted. *Only 1% of water is clean and suitable for drinking. The water we use becomes dirty and polluted, and it pollutes water sources. We can become very ill by drinking polluted water. Polluted water can harm the plants and animals living there.* Seawater itself is very salty. We cannot use it for drinking and other uses in our home. Water has to be made fit for drinking, washing, etc. Explain that water is purified at large water purification plants. In our homes, water filters are used. *Can you give some examples where you have seen water being used irresponsibly around the school?*

	How can we conserve or save water? *Can you think of ways by which we can save water?* • We can turn off the tap when not using water. • We can prevent water tanks from overflowing. • We can use water after washing fruits and vegetables to water plants. • We need to repair leaky faucets. Now they will look at Let's Find Out for Ourselves on page 63. In pairs, they will fill in the table. E.g. Brushing teeth (by using a glass or cup filled with water for rinsing). Washing fruits (placing a bowl beneath them and reusing that water/ opening the tap less).
5 mins	**Recap:** Review that water shortage occurs when there is not enough clean water to drink and use. We must recycle water by purifying it, as it is a precious resource. We need must save water by using it carefully.
	Evaluation: Worksheet **Water** may be given for evaluation. **Extension:** Use simple reference books or show children pictures and videos about water pollution and its effects on living things. If possible show pictures/videos about the importance of waste water treatment plants. You may wish to recall with them the lesson about 'staying healthy' to discuss the importance of using clean water especially for drinking. A very useful link for teachers to use with their pupils while teaching about conserving water is http://www.watercare.co.nz/Pages/default.aspx

Answers

Exercise – 1

1. a 2. b 3. a 4. b 5. c

Unit 5

Chapter 8

Using materials

Objectives	By the end of the chapter, students should be able to: • recognize that some materials occur naturally • group materials in some ways like according to their sources or according to their properties and justify their grouping • identify criteria for grouping • devise their own criteria for grouping objects • learn to use appropriate vocabulary to describe materials
Vocabulary Bank	metal, plastic, wood, paper, glass, clay, rock, fabric, sand, hard, soft, rough, smooth, shiny, dull, magnetic, transparent, opaque, bendy, waterproof, strong, weak, heavy, light

LESSON 1: 40 mins

5 mins	**Warm up:** Ask the children to observe objects around the classroom. Look around the classroom. *What is the door made of? What is the blackboard/whiteboard made of?* (wood) *What about this marker?* (plastic) *And this piece of chalk?* (chalk) *What about the school building?* (cement, bricks) Explain that all objects are made from some kind of material. *Wood comes from trees. Chalk is found naturally in the Earth. Plastic is made from petroleum from the Earth. Cement and bricks are made of different materials together.*
30 mins	**Main Lesson:** Review information from the previous class. What are the two main sources of materials? They may be natural, or man-made. Read page 67 and discuss all the examples in detail.

	Natural materials are obtained from natural resources like animals, plants, from the ground or under the ground. But these cannot be used in their raw form and need to be treated to make the objects we want. Read pages 68-71 and discuss all pictures. Explain that there are different types of a single material due to the uses. Materials may be grouped according to their characteristics. The characteristics of a material are called its properties. Do Exercises 1 and 2 on pages 72 and 73 in class.
5 mins	**Recap:** Review the main points of the lesson. *Can you name the four main sources from where we obtain natural materials?* • Plants • Animals • Ground • Under the Ground We use materials according to their properties. They can be grouped based on their sources, properties (soft, hard waterproof etc), or how they are used.

LESSON 2: 40 mins

5 mins	**Warm up:** *We have learnt that we can group materials in many ways.* For example, they can be grouped on the basis of their sources (natural/man-made), properties (strong, hard, soft, smooth, rough, waterproof, flexible, transparent, etc.) and uses (wooden spoon for cooking because it does not heat up, large metal for serving food because it is clean, smooth and shiny, a plastic spoon for eating or mixing cake batter)
30 mins	**Main Lesson:** Now conduct the following demonstration: First show them this excellent poster on materials and their properties from: http://www.timetoteach.co.uk/Unit2DGroupingandchangingmaterials.html (reproduceed on the following pages)

Now show them the objects below:

- objects made from naturally occurring materials e.g. wood, stone, wool yarn, fibres and fabrics(cotton, silk, wool, as well as synthetic fibres and fabrics)
- different objects made of the same material : a plastic spoon, a metal spoon, a wooden spoon
- flexible and non-flexible, transparent and opaque plastics in different colours
- rubber products such as an eraser, parts of an old tyre, rubber gloves, rubber band, elastic used in clothing
- magnets and magnetic and non magnetic materials
- a variety of metallic objects made of aluminuim (foil), steel (spoon or pan), copper (copper wire) and tin (soft drink can)

Pass them around so that the students can feel them help them fill in the table below.

OBSERVATION SHEET

Name of Object	Description	Material

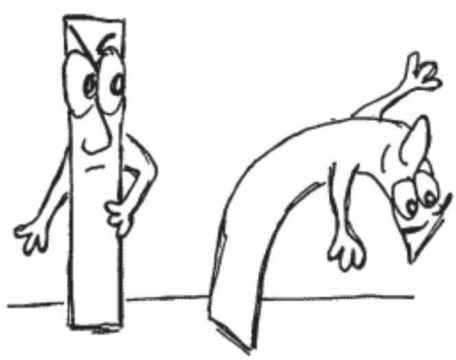
Looking At Materials

Ask yourself these questions when you are looking at materials.

What does it **look** like?

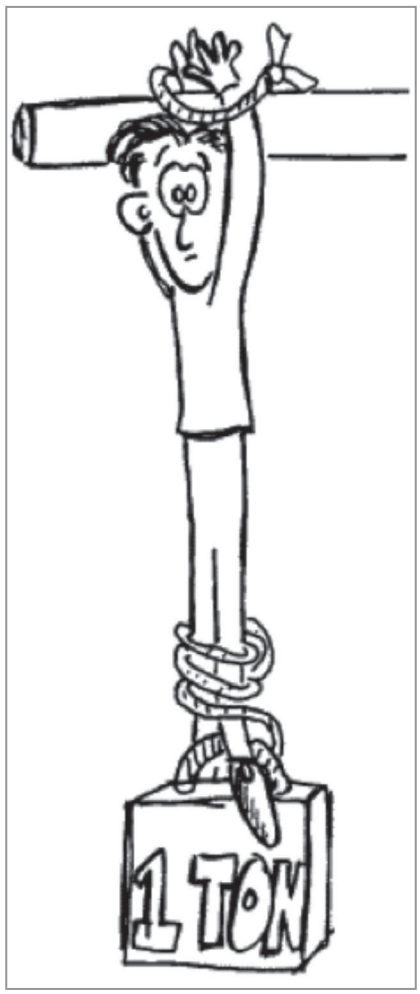
Can you **see through** it?

What does it **feel** like?

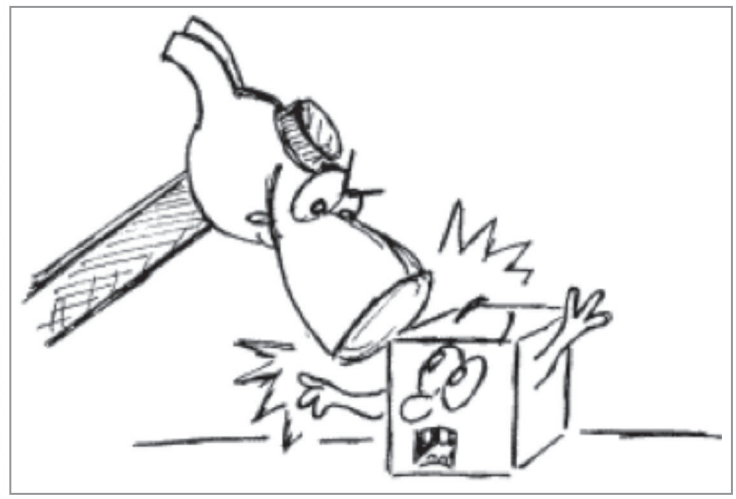


Will it **bend**? Will it **break**?

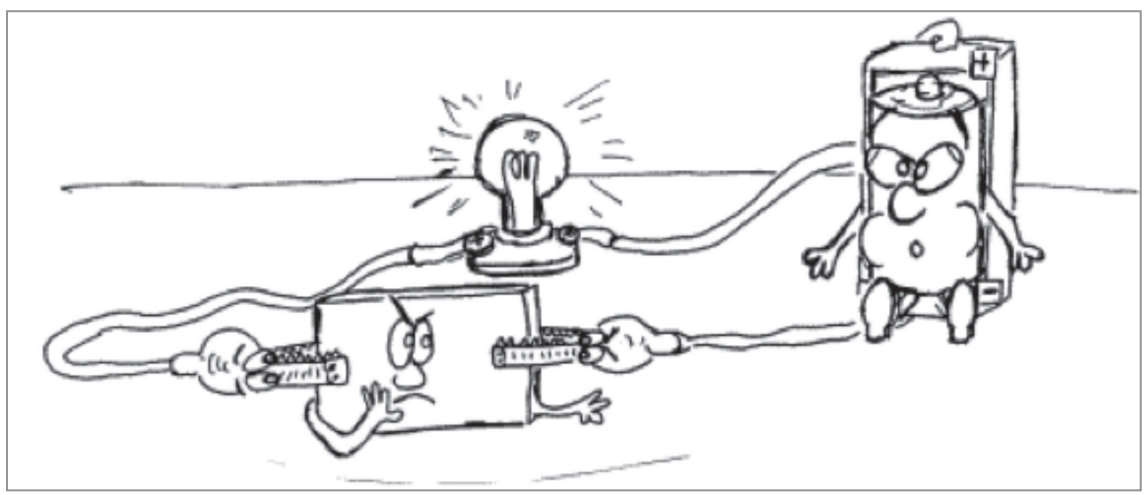
Does a **magnet** attract or repel it?



Will it stretch? Can you squash it?



Is it hard? Is it soft? Is it heavy? Is it light? Compared to what?



Will electricity pass through it?

Source: http://www.timetoteach.co.uk/Unit2DGroupingandchangingmaterials.html

	Discuss each object with reference to its properties and use, as well as its source. Make sure you use the relevant vocabulary and the students use it in their descriptions. This can be done in pairs as well where each pair is given a few objects which they will observe and then share with the class. The observation sheets will be filled in as well.
5 mins	Recap: Materials are obtained from natural sources: animals, plants, ground and under the ground. They may be man-made as well like glass, plastic, steel and clay. We use different materials because of their properties.
	Evaluation: Evaluation: Let's Find Out for Ourselves on page 71 can be done as a home assignment and discussed in class. The worksheet **Using Materials** may also be given.
	Extension: In groups of three, the students can do Exercise 3 on page 73 and present it before the class.
	Safety: • Glass objects may be avoided or used with extreme caution with young children. Children could be shown glass items/objects that are not likely to fall/slip out of their hands e.g. children could touch windows etc. • If sheep's wool is used it must be washed before being handled by children. Bones must be sterilised if they are used. • Do not bring objects with sharp edges or corners to use in this lesson.

Answers

Exercise – 1

Woollen scarf – animal

Lump of coal – under the ground

Wooden spoon – plant

Clay pot – ground

Leather bag – animal

Cotton thread – plant

Exercise – 2

1. b
2. c
3. a
4. c
5. b

Unit 5

Chapter 9

Changing materials

Objectives	By the end of the chapter, students should be able to: • explore materials using appropriate senses and making observations with simple comparisons • describe ways of making materials or objects change, using appropriate vocabulary • identify some materials which can be changed by squashing, bending, twisting and stretching, some that easily change back and some that cannot easily be changed e.g. stone • understand that materials often change when they are heated • realize that the new materials made are different and often useful • use the results to draw a conclusion about which place is warmest • recognize that some materials are naturally occurring • realize that natural materials can be used to make man-made materials • learn to use a table to record observations
Vocabulary Bank	squash, bend, twist, stretch, heat, cool, freeze, melt, boil, fair test, material, natural, manufactured
Resources	plasticine, play dough (Play-Doh), clay elastic bands, foam sponges, soft rubber ball, ice cubes, bowls, electric kettle/stove

LESSON 1: 40 mins

5 mins	**Warm up:** Review that all objects are made of materials obtained from natural or man-made sources.

	Give them the example of a chair. *What is it made of?* Wood. But it is different from its original form as it has been cut, given shape and polished before it can become furniture. Ask children to think of other ways in which materials may be changed. Show them different material like paper, aluminium foil, plasticine, and ask them what we can do with them (squash, pull, fold, roll, stretch, cut etc.). Tell them you will try out and see for yourself what we can do.
30 mins	Main Lesson: Give the students plasticine, play dough (Play-Doh), clay elastic bands, foam sponges, soft rubber ball etc. and ask them to make a variety of shapes by twisting, stretching, bending, or squashing the materials. Ask children to describe what happens. Now explain that materials change because you cannot use them as they are. They are changed through different processes to make them usable. Squashing, bending, twisting, stretching are examples of force, or energy applied to change something. Now turn on the kettle and let the water boil. Meanwhile, show them some ice cubes. Place ice cubes in small bowls in 5 places. Leave the cubes in a bowl outside for a while. Ask the students to observe them every 10 minutes. Ask children to touch the ice and describe what it feels like. Tell them to observe what happens over the course of the session, answering questions e.g. *What happens to its shape, why is it changing shape? They are hard* and of fixed *shape*. Now observe their shape. Is it changing? *What is happening? They cubes have changed into water because they have melted.* Describe ice as 'cold' and use terms e.g. 'melting', 'turning to water' when describing what happens to it. Now tell them to pour the water back into their bowls. *What do you think will happen when we place these bowls back into the freezer?* Show them water boiling in an electric kettle. Explain that water has now turned to steam, which we can see coming out of the kettle. Help the students to answer the questions about the investigation on ice melting on page 78.
5 mins	Recap: Review that some materials can be changed by squashing, twisting, bending or stretching. The material remains the same. Material can be changed by cooling and heating as well.

	Safety: Children should not touch ice immediately after it has been taken out of a freezer. Heating exercise should **NOT** be done by the students. The teacher will demonstrate it keeping the students a safe distance away. They should **NOT** come anywhere near steam. Use of cookers/burners/ovens must be carefully supervised.

LESSON 2: 40 mins

5 mins	**Warm up:** Review the last lesson. Materials can be changed to suit our needs. *Can you name a few ways they can be changed by applying force?* Write their responses on the board.
30 mins	**Main Lesson:** Read pages 74–76 together. Discuss all the examples in the text with reference to what the children observed in the previous lesson. Explain that all man-made materials like glass, plastic etc are all made by combining natural materials or by heating, using force, mixing, cooling and other processes in factories to produce the required material. Glass is made by heating sand. The students will complete Exercise 1 and 2 in class.
5 mins	**Recap:** Review the lesson. Materials can be changed by applying force, heating, cooling, mixing etc. Materials changed by applying force still has its original characteristics or properties, e.g. plastic can be moulded and made in different colours and shapes, it is light, waterproof and flexible and translucent.
	Evaluation: Give the students the worksheet **Changing Materials**.

Answers

Exercise – 1

1. a 2. b 3. a 4. b 5. b

Exercise – 2

a. Materials can be changed in many ways. Such as cutting, baking, polishing, pressing or shaping.

b. We change materials to make it useable in a better way

c. When we mix or heat material we can make new materials.

d. When properties of a natural material are changed it becomes a man-made material.

e. The quality of a material changes after heating and mixing. It cannot be converted into its original form.

f. Not always. But most of the changes caused by cooling can be reversed.

Unit 6

Chapter 10

Force and movement

Objectives	By the end of the chapter, students should be able to: • understand that forces make things speed up, slow down, change direction or shape • recognize that factors like the surface and how hard you push make a difference in the distance travelled by an object • measure distances travelled in units, recognising that marking the starting and finishing points is important • realize that heavier objects need bigger pushes and pulls to change their speed or direction • become aware that gravity and friction are invisible forces • recognize that friction happens when two objects rub together and that friction slows down movement • learn that gravity is the force pulling things to the centre of the Earth • observe and conclude that vehicles move faster on a sloping track; the steeper the track, the faster the vehicles move • deduce that vehicles move faster on a smoother, harder track
Vocabulary Bank	squash, bend, twist, stretch, fair test, material, soft, hard, smooth, steep, flat, rough, high, higher ,medium, low, further, furthest, fast, faster, fastest, slow, slower, slowest, direction, distance, force
Resources	• collection of toy cars and other toys that move • apparatus for measuring length e.g. metre sticks or tape measures • bricks and pieces of wood/thick card to make ramps • collection of pictures or video clips showing moving objects • different types of material to give different amounts of friction e.g. fur, felt, shiny paper

LESSON 1: 40 mins

5 mins	**Warm up:** Tell the students that you have already learnt that force is used to change the shape of objects. Give them plasticine and tell them to make different shapes by squashing, twisting, rolling, stretching etc.
30 mins	**Main Lesson:** Read pages 80 and 81. Discuss the pictures and explain what force can do. Attach a small string to a toy car and pull it. Now let go of the string and push the car. Explain that when we apply force to move something towards us, it is called a pull. When we apply force to move something away from us, it is called a push. Tell them to stretch the plasticine. *This is a pull. Squash it now. This is a push. Now bend it. This is a twist.* Make sure that you demonstrate this yourself along with the children. Present children with a collection of toy cars and ask them how to make them move faster, slower, or change direction. Ask one group to tell the class how they made their car speed up, and another to tell how they made their car slow down. Did anyone find any other ways? What forces did you use? Why did the materials make the car move slowly? This would be a good time to introduce the terms **gravity** and **friction**. Ask children to talk about how to make themselves move fast e.g. on a bicycle, roller blades, a slide and how they make themselves slow down. If possible go into the playground where children can demonstrate using equipment e.g. scooters, slides, swings and see how they make themselves slow down.
5 mins	Review the salient points of the lesson.

LESSON 2: 40 mins

5 mins	**Warm up:** Tell the students that you have already learnt that force is used to change the shape of objects.
30 mins	**Main Lesson:** Divide the class into four groups. Make four stations in the class. Use a large smooth piece of cardboard to use as a ramp. Use a pile of books to adjust

	the height of the ramp throughout the investigation. One toy car should also be present at each station. Tell the students to make their ramps very steep (high) and push the car down the ramp. Mark with a pencil the distance travelled. They should record their results in the table on page 84. You will help them complete the table and conduct the investigation. Now ask them why the highest or steepest slope helped them come down the farthest? *A force called **gravity**, which pulls objects down. We cannot see gravity. When we throw a ball up into the air, it comes down. This is because of gravity. If there will be no gravity, everything around us, including ourselves, would float around.* *There is also another force called friction. We cannot see friction. Friction is when two objects rub against each other, resulting in them slowing down.* *The car came down the steep slope very fast because the slope was at a greater height and it was very smooth.* *What happened with the slopes which were at lower heights?* This is an excellent activity illustrating the relationship between a push, pull and slope and the speed and distance an object travels: http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml
5 mins	**Recap:** Ask them to give an example of gravity and friction. Do Exercise 1 to wind up the lesson.
	Evaluation: The worksheet **Force and Movement** may be given for evaluation.
	Safety: 1. If P.E. activities are done like jumping up and down, sliding, pushing one another on a swing, then teachers must observe and monitor pupils at all times.

Answers

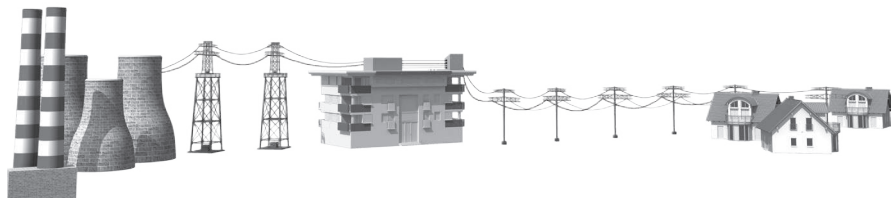
Exercise 1

1. b 2. a 3. a 4. a

Unit 7

Chapter 11

Using electricity



Objectives	By the end of the chapter, students should be able to: • understand that electricity is a kind of energy. Electrical appliances are used to produce heat, light, sound and movement. • recognize that mains sockets are dangerous • recognize the importance of following safety rules whether using mains electricity or batteries • learn that electrical appliances must be used safely • group the appliances into categories depending on what they do • recognize that different electrical appliances may use different sources of electricity • understand that the appliances that need more energy run on mains electricity and that they need to have a plug to connect to the socket • differentiate between dangerous and less dangerous sources of electricity and understand that batteries are a safer source of electricity • identify ways batteries might be dangerous • explain why a particular device requires a particular battery
Vocabulary Bank	appliances, mains electricity, switch, battery, names of household appliances which use electricity, handled safely

LESSON 1: 40 mins

5 mins	**Warm up:** Ask the students to think of things requiring electricity to work. *Electricity has made life easier in so many ways. What would life be like without electricity?*
30 mins	**Main Lesson:** *Objects which run on electricity are called electrical appliances. They may produce heat (heater, light bulb), sound (music system), light (bulb, computer screens), or movement (fan).*

	Explain that electricity is a form of energy. We cannot see electricity. We can only know that it is there when we see it working through objects. How do we know that there is no electricity at a certain time? When all electrical appliances stop working we realize that there has been a power cut. Read and discuss pages 86 and 87. Explain that electricity is supplied to our homes through power stations through very large metal wires called cables. These cables supply electricity to small power stations called sub-stations. These sub-stations provide electricity to our homes, which we get through electrical sockets. *Electrical appliances can be powered by electricity which comes through sockets, known as mains electricity.* *They can also work using batteries. Batteries store small amount of electricity in the form of chemicals. They do not produce electricity.* *Can you think of any battery operated appliances? These appliances require different sizes of batteries because the amount of power they require is different. A car requires a larger and more powerful battery. A torch will require smaller batteries. We also use batteries when we do not want a wire connection to mains electricity.* Read page 88.
5 mins	**Recap:** Review the main points of the lesson by asking relevant questions.

LESSON 2: 40 mins

5 mins	**Warm up:** *Have you ever been told never to touch sockets and plugs with wet hands? Why is it so?* Lead the discussion so that the students mention electricity as being dangerous and care being required to handle it.
30 mins	**Main Lesson:** Explain the basics of safety with electricity and utmost care when handling electrical appliances. *Electricity can be extremely dangerous.* *Mains electricity can cause permanent damage to us, even death.*

	A battery is also full of harmful chemicals. Batteries are not toys. What happens when you leave a battery in your toy for a very long time? A runny liquid comes oozing out. These are dangerous chemicals. *We must be very careful when handling any form of electricity.* Read pages 88 and 89 together. Explain the rules of electrical safety. In pairs, ask them to do the exercise on page 92. Discuss the answers with them in class.
5 mins	**Recap:** Ask children to come up in front of the class. One will act out a violation of an electrical safety rule, while the others will guess which safety rule the child has broken.
	Evaluation: You can give exercise 3 page 93 for evaluation. The worksheet **Using Electricity** may also be given.
	Extension: Use Let's Find Out for Ourselves on page 90 to develop scientific skills like observation, recording and grouping. Do ensure that they are able to justify the grouping according to the given criterion. It advisable to have them group different household appliances according to some other criteria such as electrical appliances and non-electrical appliances, or battery operated appliances and appliances that run on mains electricity. To view some more tips on electrical safety and a more detailed explanation of key ideas on electricity visit http://powerup.ukpowernetworks.co.uk/under-11.aspx
	Safety: 1. Mains appliances should only be used for demonstration if they have been subject to an electrical supply check. 2. Never cut open batteries. Rechargeable batteries are best avoided (except enclosed in devices such as mobile phones) as they can get extremely hot if short-circuited. 'Button' batteries could be demonstrated but are not suitable for use by younger children. Car batteries are unsuitable for use in primary schools.

Answers

Exercise – 2

- Nothing should be brought near electrical wires.
- The switch must be closed first before pulling the plug out.
- Looking at electrical wires causes no harm if we stand far.
- Electrical appliances should be kept away from wet places.
- Objects should not be poked inside electrical appliances.
- Batteries need to be kept in their proper places.

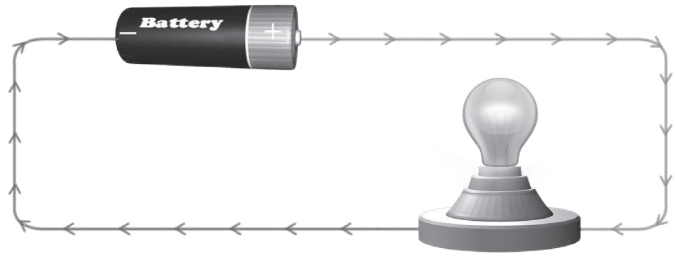
Exercise – 3

1. a
2. c
3. a
4. a
5. a

Unit 7

Chapter 12

Simple circuits



Objectives	By the end of the chapter, students should be able to: • make a complete circuit using a battery, wires and bulbs • explore how to make a bulb light up, explaining what happened, and using drawings to present results • understand that an electrical device will not work if there is no battery or if there is a break in the circuit • make and test predictions about circuits that will work • identify and state reasons why a certain circuit will not work • design, make, test and demonstrate their device and explain the importance of a complete circuit in it • understand that simple circuits can be used to make simple devices
Vocabulary Bank	appliances, mains electricity, electric current, conductors, circuit, energy source, motor, closed circuit, complete circuit, open circuit, broken circuit, switch, battery, battery cell
Resources	AA batteries, insulated copper wires, LED bulbs, masking tape, buzzer, switch

LESSON 1: 40 mins

5 mins	**Warm up:** Elicit previous knowledge about electricity from the children. *What is electricity?* A form of energy that machines use to work. *Can you name two sources of electricity?* Mains and battery *What is the flow of electricity called?* Current
30 mins	**Main Lesson:** Now move on to explain how current flows. Show them a battery, two copper wires and a small bulb. Lift each item and name it. Prompt them to arrive to the

	conclusion that they all need to be connected in some order for the bulb to light up. *This is a battery. These are copper wires. And this is a bulb. You all know that the battery is the source of energy. How we use this battery to light up the bulb?* *We will need to connect them to form a path through which electrical current will flow. This path is called a circuit.* Ask the students to form a circle. Tell the students that we will now play Pass the Parcel. Give one student your mobile with some music stored in it. Say "Start", and the children will pass a small book around. Say "Stop", and when the music stops, the book is not passed onto the next pupil. *I am like a switch when I say 'Start' and 'Stop', the music is like the battery, the book being passed around is like the current, and all of you are the wires through which the current flows. This whole circular path is a circuit.* Now, move three students from the circle, creating a gap. Explain that the current will not flow if there is a break in the circuit. Read pages 94 and 95. Provide the children the material above to construct a simple circuit. Ask them to draw a simple circuit in their notebooks. When children draw circuits at this stage they will not use standard symbols. However, they may design their own or you can help them make simple symbols. To further their understanding, they can replace the light bulb with a buzzer.
5 mins	**Recap:** Ask the following questions: *What is a current? How does current flow? Can a circuit flow in any direction?*

LESSON 2: 40 mins

5 mins	**Warm up:** Review the components of a circuit. *Two copper wires, a bulb and a battery are required to make a circuit.* *However, what if they are connected in different ways? Will we be able to light the bulb?*
30 mins	**Main Lesson:** Ask the students to work in groups of five. Take ten copper wires. Label 5 copper wires 'blue' and 5 wires 'red'. Each group will be given an AA battery, two wires (one labeled 'red' and one labeled 'blue') and an LED bulb. Turn to page 96 and explain the activity.

	Each child in the group should be given a chance to try out a circuit arrangement given in the activity. Discuss the results with the whole class. Help them conclude that electrical circuits will not work if there is a break in the circuit or if an energy source is missing. Children should be prompted to explain why the bulb will or will not light, e.g. saying this will not work because both wires are attached to the same end of the battery, or this will not work because there is no energy source (battery cell, battery) in this circuit. Now ask them to work through Exercise 1 on page 97 in their groups, and then discuss the answers together in class, removing any misconceptions the students may have.
5 mins	**Recap:** Current flows in one direction and only if the circuit is constructed properly, with separate wires connected to each end of the battery. Review safety rules discussed in the last chapter about handling batteries.
	Evaluation: The worksheets on Simple Circuits may be used to evaluate the students.
	Extension • To view a more detailed explanation of key ideas on how electricity travels visit http://powerup.ukpowernetworks.co.uk/under-11/circuits/simple-circuits.aspx • A project can be given where the students will be required make a simple model of an object with bulbs to be lighted e.g. a car, a toy house, a lighthouse, a torch, etc.
	Safety: 1. Mains appliances should only be used for demonstration if they have been subject to an electrical supply check. 2. Never cut open batteries. Rechargeable batteries are best avoided (except enclosed in devices such as mobile phones) as they can get extremely hot if short-circuited. 'Button' batteries could be demonstrated but are not suitable for use by young children. Car batteries are unsuitable for use in primary schools.

Answers

Exercise 1

a. True b. False c. True d. False e. False f. False

Chapter 13

Unit 8

More about sounds

Objectives	By the end of the chapter, students should be able to: • recognize ways sound is produced • understand that sound is produced as a result of vibrations • identify the ear as the organ for hearing • differentiate between different types of sounds • demonstrate their understanding of how sound travels through a simple experiment
Vocabulary Bank	shaking, plucking, blowing, vibrating, vibrations, travel, loud, soft, near, far, high, low
Resources	several long pieces of string, 20 plastic cups

LESSON 1: 40 mins

5 mins	**Warm up:** Blow a whistle. Now clap your hands. Stomp your feet. Jingle a bell. The students will anticipate that they will learn about sound. Write the word 'Sound' on the board. Ask them what comes to their mind. Responses like ear, loud, bang, zoom, buzz, shhh etc. should be written on the board.
30 mins	**Main Lesson:** *Have you ever wondered what sound is? How is it made? How do we hear different sounds?* Sounds are made with the vibrations. Vibrations are movements in the air. Pass around the whistle, bell and rattle you used at the beginning of the lesson. When a child uses it, tell him to put his hand on the object. He will be able to feel the vibration. Explain that sounds can be created by shaking, plucking, blowing and in many other ways.

	Show them your mobile phone and put it on vibration mode. Ask the students to feel it. *Can you feel these repeating movements? These are called vibrations, and sound it produced when these vibrations travel in the air from one place to another, and reach our ears.* Now play a ring tone on your mobile phone, and raise the volume. *Is this a loud sound? Can you hear it clearly?* Now give the phone to a child make him go outside the classroom and play the music from behind the closed door. *Can you hear the sound? Is it still loud? This is because you are farther away from the source of the sound. When we move away from the source of sound, it becomes quieter.* Read pages 98 and 99 and discuss the uses of sound.
5 min	**Recap:** Review the lesson by asking relevant questions: *Sound travels through…?* *When the source of sound is close, the sound we hear is ….?* *When the source is far away, the sound is …?* *Can you name any three things we can know with the help of sound?*

LESSON 2: 40 mins

5 mins	**Warm up:** Begin the lesson by reviewing the salient points of the previous lesson. *We cannot see sound but can feel it. We can feel it by hearing the sound, and by sometimes feeling the vibrations, like you did when you blew the whistle or shook the rattle. Today you will see yourself how sound travels through vibrations by making your own telephone.*
30 mins	**Main Lesson:** The children will work in pairs. Distribute one large string and two cups to each pair. Explain the activity Let's Find Out for Ourselves on page 100 and 101. After conducting the activity, they will complete the checklist on page 100. Discuss their responses with the whole class. Exercise 1 on page 102 can be given for homework.

5 min	**Recap:** The students will do Exercise 2 on page 103 in class as a review of what they have learnt in the chapter.
	Evaluation Worksheet **More About Sounds** can be given to evaluate the students.

Answers

Exercise – 1

1. a
2. b
3. a
4. b
5. b
6. a
7. a

Exercise – 2

a. vibrates
b. see
c. heard
d. know about
e. pick up
f. sound

Unit 9

Chapter 14

Around the Earth

Objectives	By the end of the chapter, students should be able to: • identify the features of the Earth, Sun and Moon • understand the orbit of the Earth and Moon • recognize that the rotation of the Earth causes day and night
Vocabulary Bank	revolution, rotate, axis, star, orbit, phases of Moon, day, night

LESSON 1: 40 mins

5 mins	**Warm up:** Elicit previous knowledge about the Earth. *What is the name of the planet on which we live?* Earth *What is the shape of the Earth?* Sphere *The Sun rises in the …?* Morning, from the east and settles in the west *What can we see at night?* The Moon and stars *How many hours are there in a day? 24* *Some of these hours are day and some are night.*
30 mins	**Main Lesson:** *Do you know what causes day and night?* *The spinning of the Earth causes day and night to occur. The Earth spins round and round on its axis, like a top. Axis is like a line running through the Earth. It takes 24 hours for the Earth to make one complete turn on its axis.* Turn the globe very slowly to demonstrate this. Give a child a torch and tell him to point it towards one side of the globe, holding it still. Now rotate the globe slowly, explaining that the torch is the Sun's light, and

	whichever part of the Earth facing the Sun has day and the part is away from it has night. Now tell them that in addition to rotating on its axis, the Earth also revolves around the Sun. Show this by moving the entire globe around the child holding the torch, while simultaneously spinning the globe. *This circular path is the orbit of the Earth.* *The Moon rotates around the Earth. It has its own orbit.* Take three different sized balls. *The largest ball is the Sun.* Place it in the centre. Now take the medium sized ball. *This is Earth.* Rotate it around itself and then make it rotate around the big ball. Now take the smallest ball and move it around the Earth. *This is the orbit of the Moon.* Explain that all these actions happen together. *The Earth has air and water, which are necessary for all life and living things. We can survive for a while without air, but not at all without oxygen, which is present in air. The Moon does not have water or air. The scientists who travel to the moon are called astronauts.* *The Sun is a very hot star. A star is not a planet. It is made of gases. There is no water or air on the Sun. The Sun is very, very far away. Yet it is so large and hot that we feel its heat on the Earth.* *Man has been to the Moon, but nobody has been to the Sun.* *Do you know what the name of the first man on the Moon was?* Now read pages 104-107.
5 mins	**Recap:** Review the salient points of the chapter. Ask the students to find out why the Sun rises in the East and sets in the West. It would be a good idea to paste compass directions (North, South, East and West) on the softboard.

LESSON 2: 40 mins

5 mins	**Warm up:** Prompt the students that the Moon will be discussed today. *We have talked about the Earth and the Sun, what else do we see in the sky? Here is a hint: we see them clearly at night.*
30 mins	**Main Lesson:** Show the children these animations about the Sun, Earth and the Moon. http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/soonmoonearth/

	Explain that the surface of the Moon is full of craters. *The Moon is close to the Earth. We can see the Moon at night, because it reflects light from the Sun. It does not produce light of its own.* *The shape of the moon appears different to us on Earth.* Show them this link on the phases of the Moon: http://www.childrensuniversity.manchester.ac.uk/interactives/science/earthandbeyond/phases/ You may also show them a poster on the phases of the Moon. Explain Lets Find out for Ourselves on page 107. Assign this task for one week's homework.
5 mins	**Recap:** Give questions about the surface, appearance and phases of the Moon based on the video they have seen.
	Evaluation Exercises 1 and 3 the worksheet **Around the Earth** can be given to evaluate the students.

Answers

Exercise 1

a. Earth is round in shape just like a ball. It is a sphere.

b. The Sun is the biggest.

c. The Moon is the smallest.

d. The Earth orbits around the Sun and it also spins around its axis.

e. The surface of the Moon is covered with dust and craters.

f. The Sun is very hot and bright; looking at it directly can harm our eyes.

Exercise – 2

1. b 2. a 3. a 4. a 5. c 6. a 7. b

Unit 9

Chapter 15

The air around us

Objectives	By the end of the chapter, students should be able to: • name the components of air • identify the properties of air • understand the importance of air • enumerate the uses of air • understand the importance of air in relation to the weather
Vocabulary Bank	air, wind, inflate, invisible, medium, vacuum, windmill, turbine, layer, oxygen, nitrogen, seed dispersal, compressed air, weather, hot, cold, powerful
Resources	Chart sheets or A4 size paper, ping pong balls

LESSON 1: 40 mins

5 mins	**Warm up:** Switch off the fans in the classroom. The children will be surprised and exclaim that it will become very hot. Ask why this is so? Prompt them to say that the fans give air. This makes our bodies cool down in the hot and stuffy surroundings. Ask them: *What is air? Has anyone seen it? How do you know it is there?*
30 mins	**Main Lesson:** *Air is present all around us. How do you know this? Can you feel air when the wind blows? When you breathe in and out? When you feel hot? When dust blows in or smoke rises? What about when we cook on our gas stoves?* Explain that air is present on the surface of the land. Air is present in very small amounts under the water. That is what fish breathe. Now give the students a small cup and fill it half with water. They can use the cups of their plastic water

	bottles. Give each student a small straw and tell them to gently blow **out** (not in like drinking juice). *What do you see?* *These small bubbles are air bubbles. We see these bubbles in the sea. We also see them in fish aquariums.* *Air is made up of different types of gases, the moist important one for humans is oxygen, which we all need to survive.* Read pages 112 and 113. *Air is invisible. Air helps us make sounds. Do you remember how sound is made? The vibrations form an object travel through air. Where there is no air, no sound is produced as the vibrations do not have a medium, or way, to travel.* *Air takes up space.* Blow a balloon to demonstrate this. *Air can move.* Take them outside or near a window. *Look at the clouds. Do they remain in one place?* Ask the students what the different uses of air are. Complete Exercise 1 and 2 on pages 116–117 in class.
5 mins	**Recap:** Review the lesson. Air is very important for us to function properly. It is made up of several gases, most importantly, oxygen which helps us to breathe. We cannot see air, it is invisible, but can feel it in many ways. Air is present on the surface of land and some amounts under water. We cannot breathe under water without special equipment because our lungs will fill up with water. Fish can breathe under water because they have special body structures, called gills, which help them to breathe. Air can move and it is necessary for sound. Air is useful to us in many ways.

LESSON 2: 40 mins

5 mins	**Warm up:** *Can you recall the different ways in which air is useful for us?* Show the students pictures of windmills. *Do you know that although air is invisible and light, it is very powerful. It is used to turn large machines such as windmills and turbines, which produce power and electricity. This kind of moving air is called wind. Wind also helps disperse seeds.* *Large ships and boats sail with the help of wind. We can fly kites with the help of wind. Can you think of other useful ways air is used?*

30 mins	**Main Lesson:** The students will conduct this activity in pairs. *We will now test the power of air.* Distribute a small A4 sized sheet of paper or card sheet to each pair, and one ping pong ball. The students will conduct the activity Let's Find Out for Ourselves on page 114 and record their results. They will discuss their observations with the class. *We have seen how powerful air can be. Air is also used to fill tyres. Machines used in mining and digging and the drill used by dentists work on compressed air.* They will now complete Exercises 3 and 4 on page 117 in class. Review the uses of air: 1. Air contains oxygen, which is essential for life. 2. Air supports burning or combustion. The oxygen present in air is essential for burning. We burn fuels to cook food, generate heat and electricity, for industries and driving vehicles. 3. Air also contains nitrogen which is essential for the growth of plants. 4. A special layer of ozone gas present high up in the air protects us from the harmful rays of the sun. 5. Moving air, called wind, has great force. It makes sailboats and gliders move. It runs windmills, which are used to generate electricity. Wind also helps in the dispersal of seeds. 6. Compressed air is used in a number of ways. It is used to fill tyres and CNG in cars. Many machines like those used in mining and digging and the drill used by dentists work using compressed air. This list can also be put up on the class softboard.
5 mins	**Recap:** Review the lesson. Air is a blessing. Humans have learned to use air in many different ways, for work and for pleasure. Ask the students to write down any three uses of air.
	Evaluation: The worksheet **The Air Around Us** can be given to evaluate the students.

Answers

Exercise 1

a. When we feel hot, cold or whenever the wind blows, we know that air is around us.

b. We feel tired and we sweat.

c. We feel relaxed and refreshed.

d. We make use of air in many ways; such as breathing, cooking etc.

e. Because there would be no fire.

f. Yes, air has force.

g. Air contains oxygen. Oxygen is necessary for the chemical reaction to take place which causes the fire to light.

Exercise 2

1. c
2. c
3. b

Exercise 3

a. weather

b. foggy

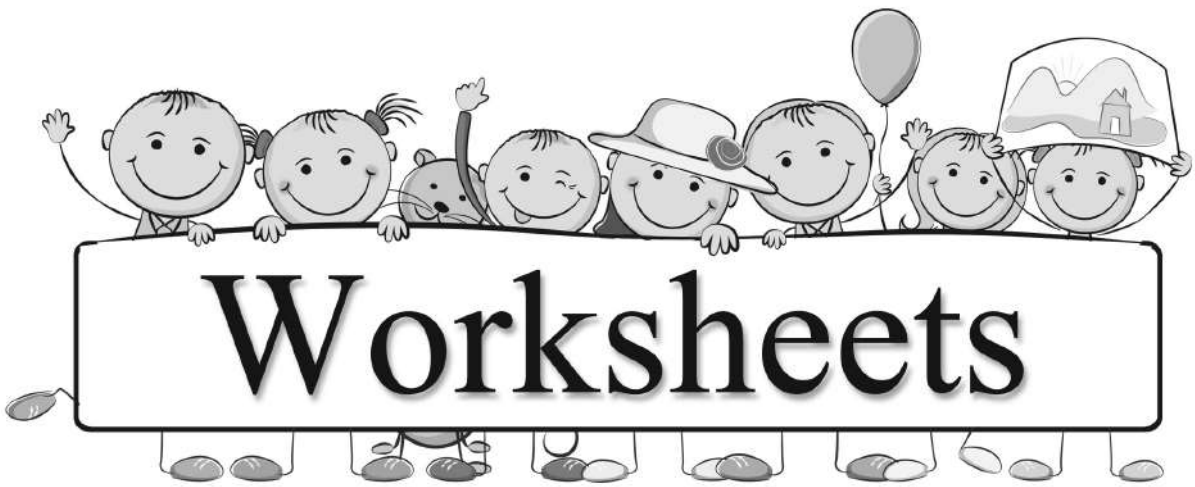
c. rain gauge

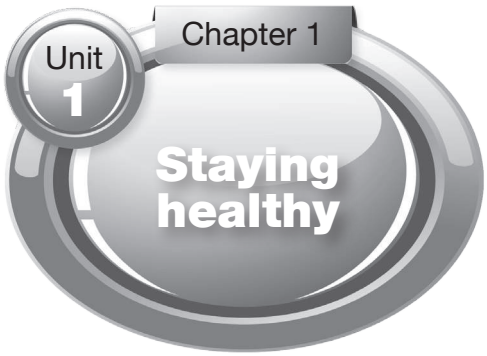
d. direction

Exercise 4

a. We wear clothes made from light fabric like cotton in hot weather, e.g. shorts, t-shirt etc.

b. We wear warm clothes made of thicker fabric in winter, e.g. sweater, jacket etc.


Worksheets



Name: _____

Class: _____

Date: _____

Name 2 dairy products:

1

2

Name 2 foods that contain proteins:

1

2

Name 5 healthy foods that you eat daily:

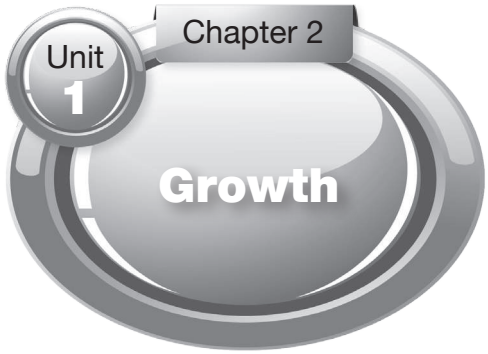
1

2

3

4

5



Name: _____

Class: _____

Date: _____

Write the name of the parents of the following animal babies:

1. Lamb ⇨ _____
2. Caterpillar ⇨ _____
3. Tadpole ⇨ _____
4. Kitten ⇨ _____
5. Puppy ⇨ _____
6. Duckling ⇨ _____
7. Cub ⇨ _____
8. Calf ⇨ _____
9. Foal ⇨ _____
10. Chick ⇨ _____

Name: _____

Class: _____

Date: _____

inhaler germs unhealthy tired medicines

Fill in the blanks with the correct answer.

1. We get ill because of _____ habits.

2. Pollution contains _____ which make you ill.

3. Unhealthy food makes you fat and _____.

4. _____ fight against germs in our body.

5. Asthma patients use an _____.

How do you keep yourself clean and healthy? List 4 ways.

1. _____

2. _____

3. _____

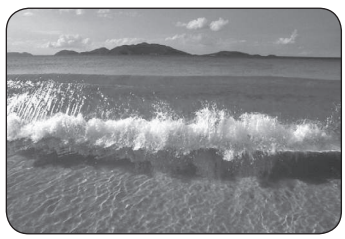
4. _____

Name: _____

Class: _____

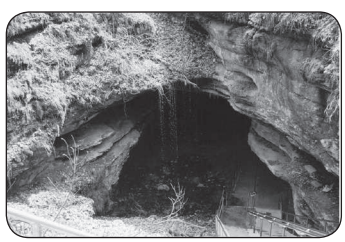
Date: _____

Name the following animals and match them to their habitat.



_ a n _ a
4 2

b e _ r
1



s h _ r k
3

_ u r t l e
5

Now arrange the letters to form the correct word:

Living things __ __ __ __ __ to their surroundings.
1 2 3 4 5

Name: _____

Class: _____

Date: _____

tiger	elephant	snail	shark	parrot	ant
scorpion	snake	house fly	crab	ostrich	butterfly

Categorize the animals above as vertebrates or invertebrates:

VERTEBRATES	INVERTEBRATES

Name: _____

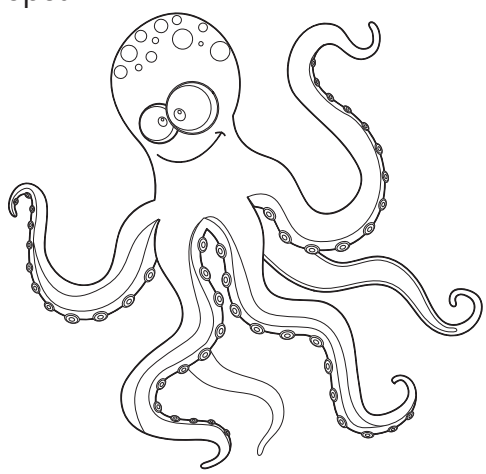
Class: _____

Date: _____

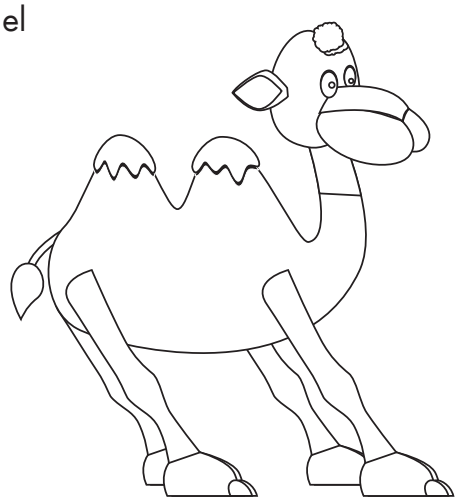
Humans are vertebrates. Our skeleton helps us to support us. Animals without skeletons are called invertebrates.

Look at the following animals. Write below each picture whether it is a vertebrate or an invertebrate. Colour the pictures.

Octopus



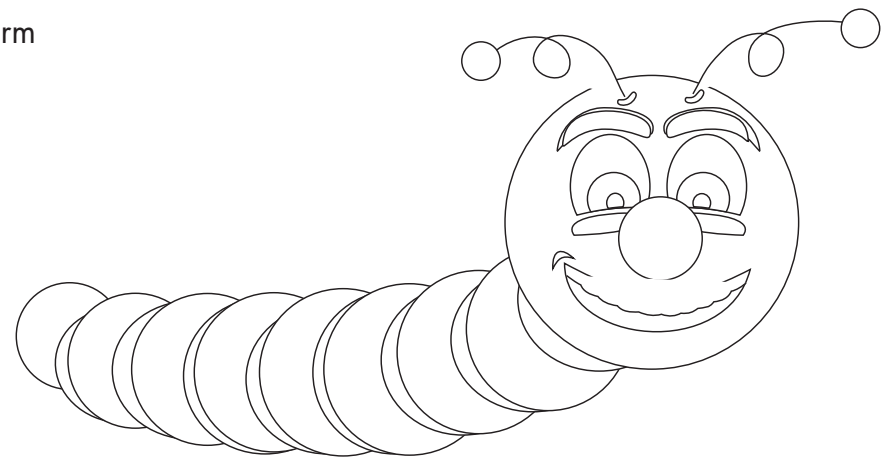
Camel



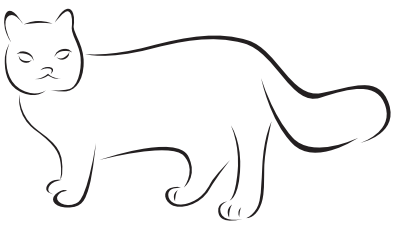
Fly

Animals

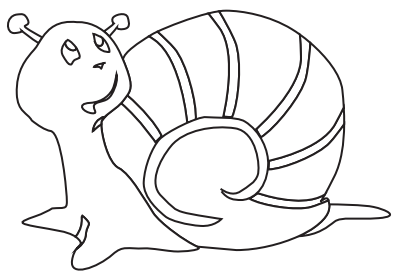
Worm



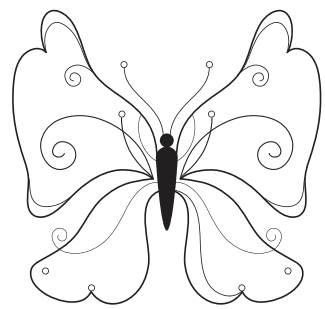
Cat



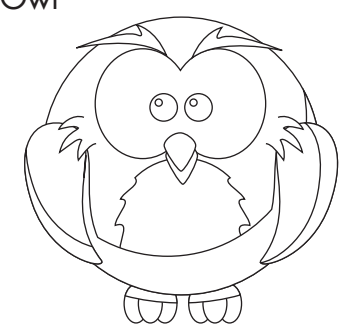
Snail



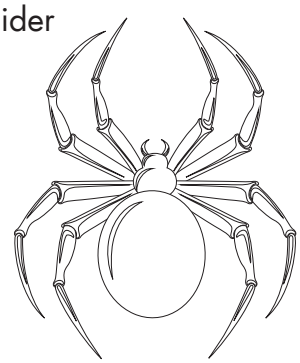
Butterfly



Owl



Spider



Mole

Name: _____

Class: _____

Date: _____

Name 3 flowering plants:

1	2	3

Name 3 non-flowering plants:

1	2	3

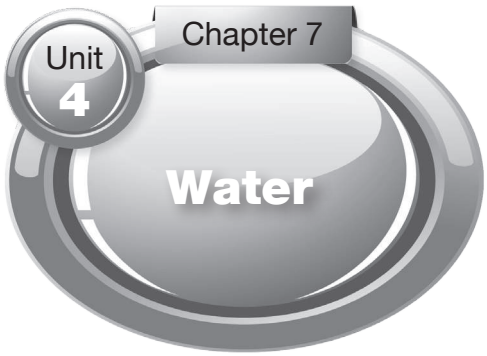
Look at the following pictures and name the flowers:

_____

_____

_____

_____



Name: _____

Class: _____

Date: _____

Look around your school. Draw places where you can find water.

Water is used for _____

_____

_____

I saw water being used in a responsible manner (Tick the answer below) ☐ Yes ☐ No

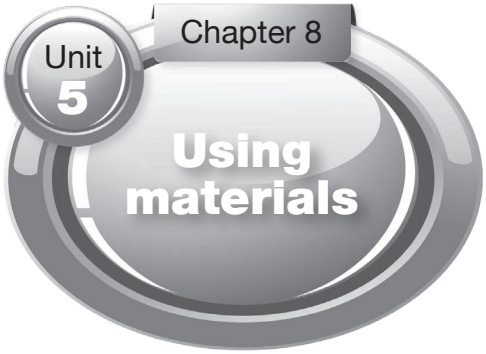
Write two ways water is used irresponsibly.

1. _____

2. _____

Write one way we can use water responsibly.

1. _____



Name: _____

Class: _____

Date: _____

Complete the flowcharts below using the words given in the box.

clay	leather	bricks	sweater	bag	ring
	ground	sack	metal	under the ground	

1. Plant → wood → Chair

2. _____ → jute → _____

3. Animals → _____ → bag

4. _____ → wool → _____

5. Under the ground → _____ → key

6. _____ → diamond → _____

7. Ground → _____ → pot

8. _____ → stones → _____

Unit 5

Chapter 9

Changing materials

Name: _____

Class: _____

Date: _____

Write down whether the change of materials below is a reversible or irreversible process.

1.  →  = _____

2.  →  = _____

3.  →  = _____

4.  →  = _____

5.  →  = _____

Unit 6

Chapter 10

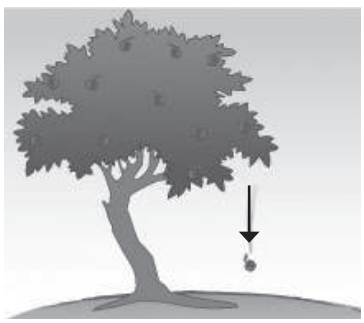
Force and movement

Name: _____

Class: _____

Date: _____

Name the forces you see in the pictures given below:



_____

_____

_____

_____

_____

_____

In your own words, write what you understand by force:

_____

_____

_____

_____

_____

_____

_____

_____

Unit 7

Chapter 11

Using electricity

Name: _____

Class: _____

Date: _____

Which of these objects use electricity?

Cut out the pictures and stick them under the correct heading on the next page.












Uses electricity

Doesn't use electricity

Name: _____

Class: _____

Date: _____

Electricity Wordsearch

Battery	Candle	Conductor	Light	Switch
Bulb	Circuit	Filament	Metal	Torch
Buzzer	Clip	Insulator	Motor	Wire

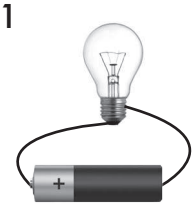
F	I	L	A	M	E	N	T
C	A	N	D	L	E	O	I
I	S	W	I	T	C	H	N
R	R	C	L	I	P	F	S
C	E	O	B	L	U	B	U
U	Z	N	M	E	T	A	L
I	Z	D	S	W	U	J	A
T	U	U	L	I	G	H	T
H	B	C	G	R	P	Q	O
B	A	T	T	E	R	Y	R
Z	M	O	T	O	R	N	O
T	O	R	C	H	O	F	M

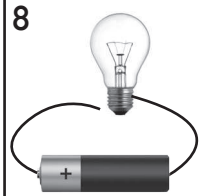
Name: _____

Class: _____

Date: _____

Look at the circuits below. Can you guess if they will work? Test and find out. Record your answers below.

Circuit	Prediction	Test
1 		
2 		
3 		
4 		
5 		

Circuit	Prediction	Test
6 		
7 		
8 		
9 		
10 		

Unit 8

Chapter 13

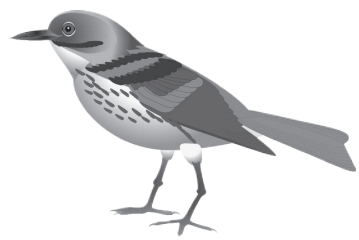
More about sounds

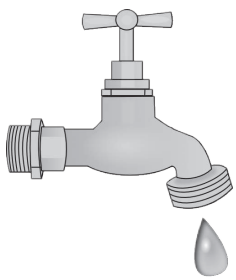
Name: _____

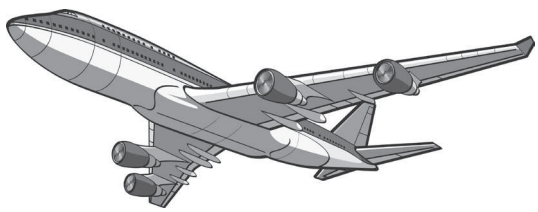
Class: _____

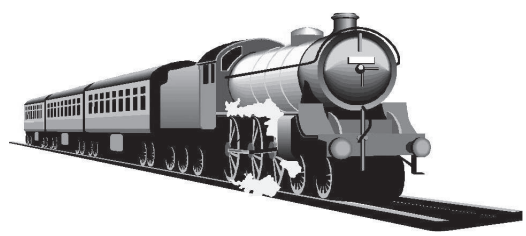
Date: _____

Circle the sounds that you can hear from far away.









Unit 9

Chapter 14

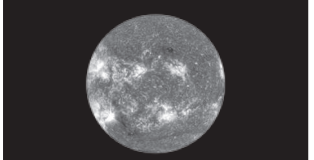
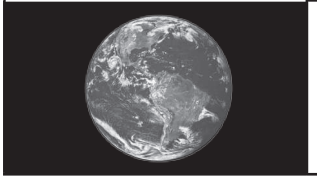
Around the Earth

Name: _____

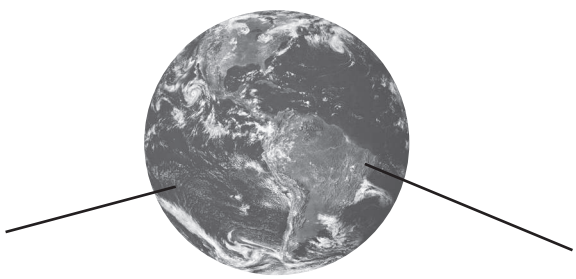
Class: _____

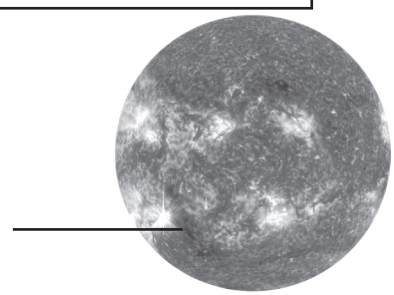
Date: _____

1. **Match the pictures up with the sentences.**

	This spins around on its axis every 24 hours.
	This is Earth's satellite.
	This is a star.

2. **Match the sentences with the labels.**





The part of the Earth that is facing the Sun has daytime.

The Sun is 1 million times bigger than the Earth.

The part of the Earth that is facing away from the Sun has nighttime.

Unit 9

Chapter 15

The air around us

Name: _____

Class: _____

Date: _____

Can you tell how air is used in the pictures below? Choose the correct answer from the words below. Remember to write the name of the object as well.

filling air drying keeping cool keeping warm flying

Object	Name of object	Air used for