



KEMENTERIAN
PENDIDIKAN
MALAYSIA

SCIENCE

YEAR 3





RUKUN NEGARA

Bahawasanya Negara Kita Malaysia
mendukung cita-cita hendak:

Mencapai perpaduan yang lebih erat dalam kalangan
seluruh masyarakatnya;

Memelihara satu cara hidup demokrasi;

Mencipta satu masyarakat yang adil di mana kemakmuran negara
akan dapat dinikmati bersama secara adil dan saksama;

Menjamin satu cara yang liberal terhadap
tradisi-tradisi kebudayaannya yang kaya dan pelbagai corak;

Membina satu masyarakat progresif yang akan menggunakan
sains dan teknologi moden.

MAKA KAMI, rakyat Malaysia,
berikrar akan menumpukan
seluruh tenaga dan usaha kami untuk mencapai cita-cita tersebut
berdasarkan prinsip-prinsip yang berikut:

**KEPERCAYAAN KEPADA TUHAN
KESETIAAN KEPADA RAJA DAN NEGARA
KELUHURAN PERLEMBAGAAN
KEDAULATAN UNDANG-UNDANG
KESOPANAN DAN KESUSILAAN**

STANDARD-BASED CURRICULUM FOR PRIMARY SCHOOL (REVISED 2017)
DUAL LANGUAGE PROGRAMME

SCIENCE

YEAR 3

Writers

Raja Shahida binti Raja Mansor
Abdul Karim bin Daud
Jong Tze Kian

Translators

Rugayah binti Tambi
Faris Adzli bin Ibrahim

Editors

Mohd Faizal bin Rus Rzerli
Siti Hanim binti Yunus
Mohamad Arshad bin Sulaiman

Designer

Muhamad Helmy bin Abdul Malik

Illustrator

Muhammad Izzuan bin Idris



DBP

Dewan Bahasa dan Pustaka
Kuala Lumpur

2018



KEMENTERIAN PENDIDIKAN MALAYSIA

Serial No.: 0037

KK 507-221-0102021-49-2215-20101
ISBN 978-983-49-2215-3

First Printing 2018
© Ministry of Education Malaysia 2018

All Rights Reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or any information storage and retrieval system without permission in writing from the Director General of Education, Ministry of Education Malaysia. Negotiation is subject to the calculation of royalty or honorarium.

Published for the Ministry of Education Malaysia by:
Dewan Bahasa dan Pustaka,
Jalan Dewan Bahasa,
50460 Kuala Lumpur.
Telephone: 03-2147 9000 (8 hunting lines)
Facsimile: 03-2147 9643
Website: <http://www.dbp.gov.my>

Design and Typeset:
Dewan Bahasa dan Pustaka

Text Typeface: Azim
Text Typeface Size: 16 point

Printed by:
Ultimate Print Sdn. Bhd.,
Lot 2, Jalan Sepana 15/3,
Off Persiaran Selangor, Seksyen 15,
40200 Shah Alam,
Selangor Darul Ehsan.

ACKNOWLEDGEMENTS

The Ministry of Education Malaysia would like to express its appreciation for the contributions made by the following:

- The Panel of Evaluators,
Textbook Division,
Ministry of Education Malaysia.
- Officers of the Textbook Division and
Curriculum Development Division,
Ministry of Education Malaysia.
- The Panel of Evaluators,
Dewan Bahasa dan Pustaka.
- Officers of the English Language
Teaching Centre (ELTC),
Teacher Education Division,
Ministry of Education Malaysia.
- The Panel of Readers,
Dewan Bahasa dan Pustaka.
- SK Lembah Subang, Selangor.
- SK Bukit Jalil, Kuala Lumpur.
- National Planetarium, Kuala Lumpur.
- MyHealth Portal,
Ministry of Health Malaysia.
- All parties involved in the process of
publishing this book.

CONTENTS



INTRODUCTION

v

Unit 1

SCIENTIFIC SKILLS

1

- Science Process Skills 2
- Manipulative Skills 15
- Leisure Science 21
- Let's Remember 21
- Let's Answer 22

Unit 2

SCIENCE ROOM RULES

23

- Adhere to Science Room Rules 24
- Do I Adhere to the Science Room Rules? 26
- Leisure Science 27
- Let's Remember 27
- Let's Answer 28

Unit 3

HUMANS

29

- Types of Teeth and Their Functions 30
- Structure of a Tooth 32
- Milk Teeth and Permanent Teeth 34
- Dental Care 37
- Classes of Food 40
- The Importance of My Food 42
- A Balanced Diet 44
- The Effects of an Imbalanced Diet 47
- The Digestion Process 49
- The Flow of Food 50
- Food Digestion 52
- Actions that Disrupt Digestion 54
- Leisure Science 55
- Let's Remember 55
- Let's Answer 57

Unit 4

ANIMALS

59

- Classification of Animals 60
- Animals' Eating Habits 62
- Dentition of Animals 64
- Changes in the Animals' Eating Habits 67
- Leisure Science 69
- Let's Remember 69
- Let's Answer 70

Unit 5

PLANTS

71

- Ways of Reproduction in Plants 72
- Importance of Plant Reproduction 74
- Single Plant, Different Ways of Reproduction 76
- Technology in Plant Reproduction 77
- Leisure Science 77
- Let's Remember 78
- Let's Answer 78

Unit 6**MEASUREMENT****79**

• Area	80
• Measuring the Area of Regular Surfaces	81
• Estimating the Area of Irregular Surfaces	83
• Volume	85
• Measuring the Volume of Hollow Boxes	86
• Measuring the Volume of Liquid	88
• The Volume of an Irregular Shaped Solid	91
• Leisure Science	93
• Let's Remember	93
• Let's Answer	94

Unit 7**DENSITY****95**

• Float and Sink	96
• Density	98
• Water Becomes More Dense	99
• Applications of Density in Life	102
• Leisure Science	103
• Let's Remember	104
• Let's Answer	104

Unit 8**ACID AND ALKALI****105**

• Acidic, Alkaline, and Neutral	106
• Acidic, Alkaline, and Neutral Substances	109
• Acidic, Alkaline, and Neutral Substances Around Us	111
• Litmus Paper Substitutes	112
• Leisure Science	113
• Let's Remember	113
• Let's Answer	114

Unit 9**THE SOLAR SYSTEM****115**

• Members of the Solar System	116
• Temperature of the Planets	120
• Orbit of Planets	122
• Revolution Time of the Planets	124
• Leisure Science	125
• Let's Remember	126
• Let's Answer	126

Unit 10**MACHINE****127**

• Pulleys	128
• The Functions of a Fixed Pulley	129
• Uses of Pulleys	131
• Invent a Functioning Pulley Model	133
• Types of Pulleys	135
• Leisure Science	136
• Let's Remember	137
• Let's Answer	137

**ANSWERS****138**

INTRODUCTION

The contents of this *Science Year 3* Textbook are written and interpreted based on the Standard Curriculum and Assessment Document (DSKP) Science Year 3 of the Standard-based Curriculum for Primary School (Revised 2017). The production of this book is aimed at fulfilling the new policy under the Malaysia Education Blueprint 2013–2025 that integrates knowledge, values, 21st Century Learning Skills, and Higher Order Thinking Skills (HOTS) through the Science, Technology, Engineering and Mathematics (STEM) approach explicitly. This curriculum is also aimed at providing education comparable to international standards.

This textbook consists of ten units that cover six themes: Inquiry in Science, Life Science, Physical Science, Material Science, Earth and Space, and Technology and Sustainability of Life. The contents of this book are designed to stimulate and capture pupils' interest in learning both in the classroom or independently. Every unit in this book includes a stimulus page, a description of the learning contents, activities, conclusion, evaluation, and enrichment activities. An answer page is provided at the end of the book to facilitate teaching and learning.

To ensure that the goals and objectives of the Science Year 3 Standard-based Curriculum for Primary School (Revised 2017) are achieved, the contents of this book emphasise aspects of HOTS that focus on inquiry and project-based learning approaches. In addition, existing elements of learning across the curriculum are added with elements of creativity, innovation, entrepreneurship, and Information and Communication Technology (ICT). Apart from that, values, positive attributes, and good working cultures are also incorporated into this textbook.

The teaching and learning strategies in the Content Standards and Learning Standards for Science prioritise thoughtful learning. Acquisition and mastery skills, and pupils' knowledge are emphasised to the optimum level. The STEM approach is integrated in a contextualised and authentic fashion in order to inculcate a harmonious learning environment among pupils through investigative activities. Fun and enjoyable learning experiences are stimulated through weaving the edutainment and the subject content.

We hope that this book will be able to enhance the quality of teaching and learning. In addition, we hope that pupils will find this book interesting and will utilise it in their learning.

ICON DESCRIPTIONS



Fun Activity

Activities that help pupils to master learning standards through innovative and creative methods, either in groups, with a partner or individually.



Let's Test

Activities that help pupils to master the learning standards through simple investigations.



Leisure Science

Enrichment activities that are interesting and challenging in each unit. These activities also aim to elicit pupils' creativity.



Let's Remember

Brief notes on the content at the end of each unit.



Let's Answer

Questions that assess pupils' understanding at the end of each unit.



HOTS

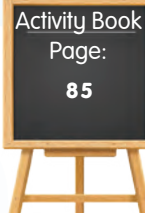
Questions that require Higher Order Thinking Skills (HOTS).



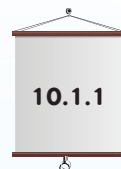
Caution

Safety aspects which pupils need to be aware of while doing activities.

Supplementary information of learning materials that can be scanned using a smartphone.

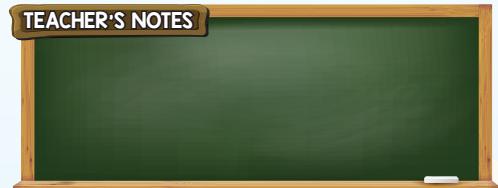


Link page of the activity book.



Learning standards from the Standard Curriculum and Assessment Document (DKSP).

TEACHER'S NOTES



Guidance and supplementary information to assist teachers during teaching and learning activities.

Unit 1

SCIENTIFIC SKILLS

Aishah, Kina, Lim, and Langgi are eating at Pak Mat's stall.

This banana fritter smells really nice!

It's sweet too.

That ice grating machine is making a sound.

This *cendol* is really cold!
It's colourful too.

Describe the observations made by Aishah, Kina, Lim, and Langgi at Pak Mat's stall.

Science Process Skills

Observing

Observing is a skill that uses all of our senses to obtain information about an object or a phenomenon.

What are the senses used to make observations in the situations below?



How do our senses help us to observe?

What are the changes you observe to the mimosa plant in the situations below?

Before being touched



When touched



After being touched



Fun Activity

What Am I?



Apparatus and Materials

- blindfold
- box



rubber



hibiscus



soap



bell



lime

Steps

1. Select one member of your group as a referee while the rest as the players.
2. Blindfold the players.
3. The referee puts the objects into the box without being seen by the players.
4. Each player picks an object from the box and guesses it using his/her senses excluding the sense of sight.
5. The referee listens to the player's guess. If it is wrong, the player takes off the blindfold and looks at the object.
6. The next player takes his/her turn. Repeat steps 2 to 5 with other objects until a winner is determined.
7. The player who guesses the most objects correctly wins.

Question

Which senses helped you to recognise the objects correctly in this activity?

TEACHER'S NOTES

- Teachers may use other suitable objects for this activity.

Activity Book
Pages:

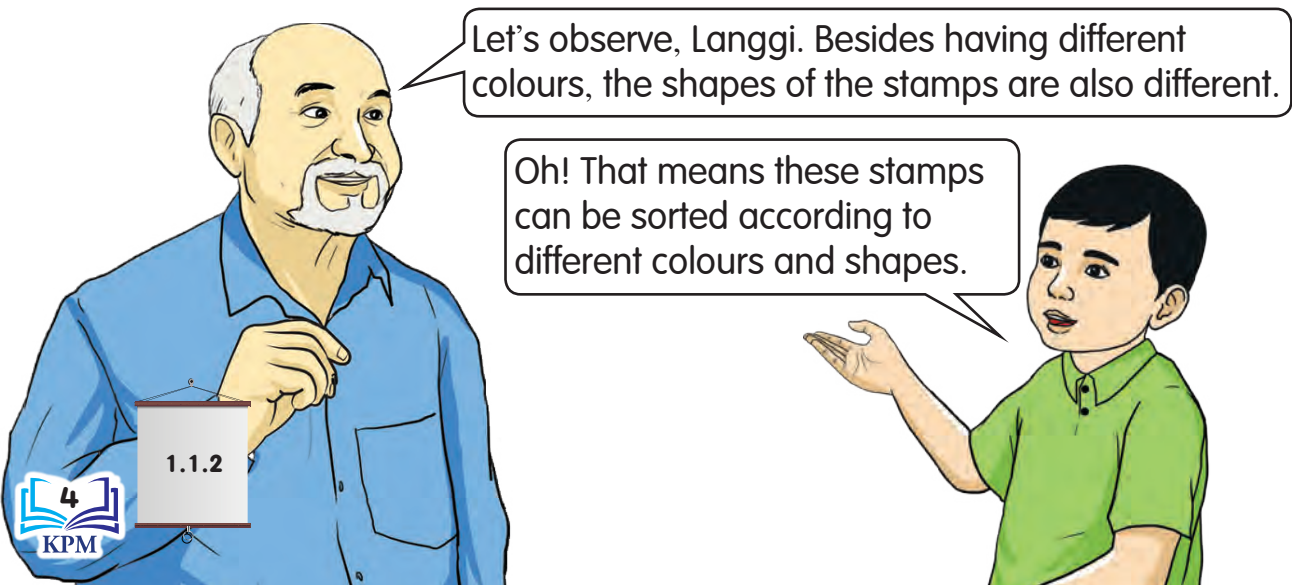
1-2

Classifying

Langgi wants to help sort his grandfather's stamps into an album. What are the characteristics of these stamps that you observe?



How can you help Langgi sort out the stamps?



Stamp Collection



Shape

Triangle



Rectangle



What other characteristics do you use to sort these stamps?



Fun Activity

Tidy Up Your School Bag



Apparatus and Materials

- books in your school bag



Steps

1. Identify the characteristics of the books in your school bag.
2. Separate and group the books according to the characteristics you have identified.

Question

What are other characteristics that can be used to classify the books in your school bag?

TEACHER'S NOTES

- Other materials such as coins, banknotes, postcards, and greeting cards can be used for the classifying activity.

Activity Book
Page:

3

Measuring and Using Numbers

Measuring is a skill to make observations using numbers and standard unit tools.



Step 1



Push this button to reset the time to zero.

Step 2



Push this button to start recording the time.

Step 3



Push this button again to stop recording so that you can take the reading.



What is the actual time taken on this digital stopwatch?

1.1.3

TEACHER'S NOTES

- There are two types of stopwatch: digital and analogue.
- The accurate time taken on the stopwatch above is 3 minutes and 59.29 seconds.

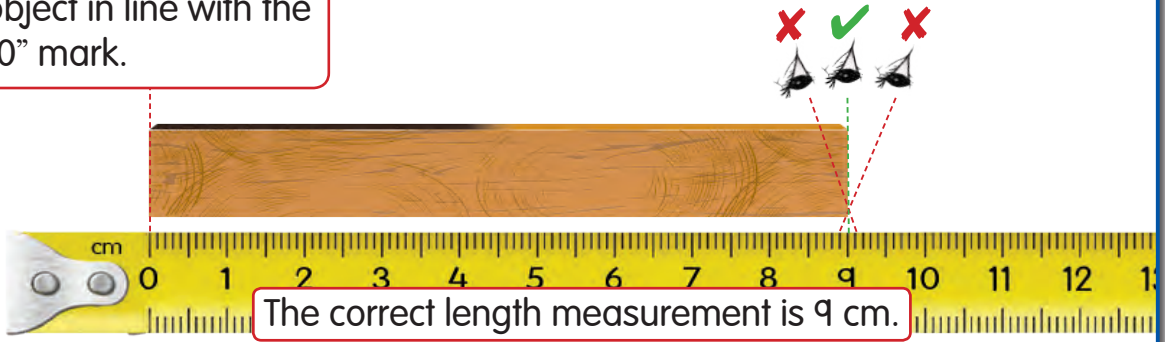
How do we measure length correctly?

Step 1

Place the end of an object in line with the “0” mark.

Step 2

The correct position of the eyes is at the tick ✓.



Let's Test

Measuring Correctly



Apparatus and Materials

- digital stopwatch
- ruler
- paper clip
- pencil
- toy car
- marble

Steps

1. Measure the length of the pencil and the paper clip using suitable apparatus with the correct technique.
2. Push the toy car on the floor and start the stopwatch. Measure the time taken until it stops.
3. Roll the marble on the floor and start the stopwatch. Measure the time taken until it stops.
4. Record the readings of steps 1 to 3 as in Table A using the correct standard unit.

Table A

Object/Activity	Measurement	Measuring tools	Reading (Unit)
Pencil	Length		
Paper clip	Length		
Movement of toy car	Time		
Movement of marble	Time		

Question



HOTS

Can length measurement be used to record time? Why?

Activity Book
Pages:

4-5

Making Inferences

Making an inference is a skill to reasonably explain an initial conclusion of an observation.

Let us read the conversation between Langgi and his friends below.



“Maybe the plant is watered every day” and “Perhaps the plant has been given enough fertilizers” are inferences made from the observations above.



Based on the situation above, can you state any inference about the wilted and yellowish plant?

Inferences that are made may be true or false.

Inferences can be made based on the following steps.




Fun Activity

Picture Story



Apparatus and Materials

- marker pens
- glue
- manila cardboard
- magazines
- scissors 



Steps

1. Choose and cut two pictures from the magazines.
2. Paste the pictures on a manila cardboard.
3. Discuss and write inferences based on the situations shown in the pictures.
4. Present to the class.

Question

What is the difference between observing and making an inference?

TEACHER'S NOTES

- The activity above can be carried out using the One Stay, Three Stray method of the 21st Century Learning Skills.

Activity Book
Pages:

6-7

Predicting

Predicting is a skill to state an expectation of an event that will happen.

Predict what might happen if one of the children does not move his/her feet in this race.



Predictions may be true or false.

Look at the situation below.



Predict the colour of the cream that comes next.

Predicting is not the same as guessing because prediction is made based on **observations, previous experiences, data** or **patterns**.

Based on this picture, predict what will happen next.
What is your evidence to support the prediction?

More than one prediction can be made.

Look at the situation below.



What is your prediction on the movement of the ball?

Activity Book
Pages:


7-8

Communicating

Communicating is a skill to describe an action, object or phenomenon using words or graphic symbols such as tables, graphs, diagrams or models.

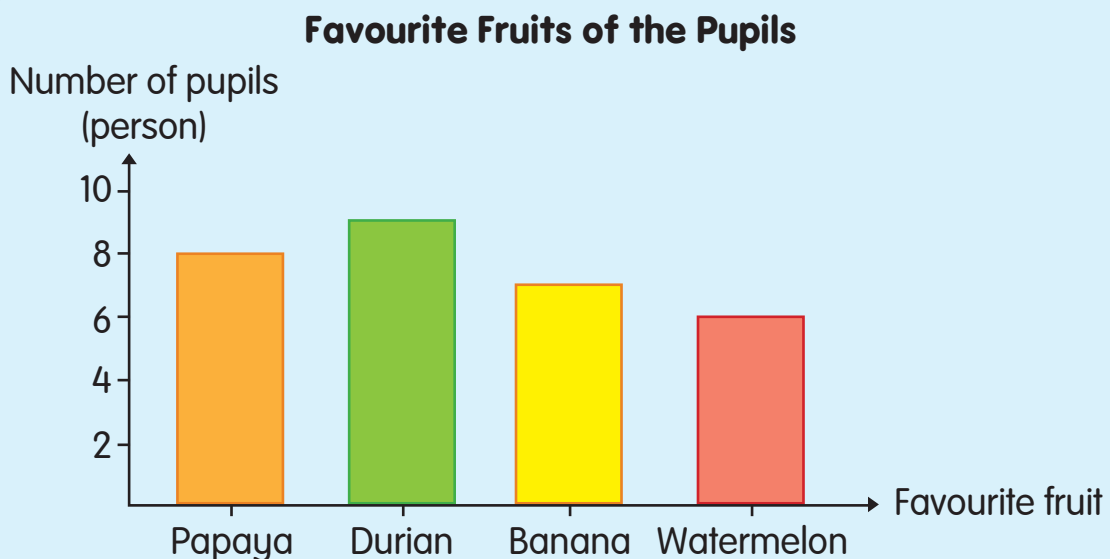
Let us look at the example below.

Year 3 pupils collected information about the number of pupils in their class and their favourite fruits. The information was recorded in a table.



Favourite fruit	Number of pupils (person)
Papaya	8
Durian	9
Banana	7
Watermelon	6

Information from the table can be transferred to other forms such as a bar chart.





Let's Test Recording Information













Apparatus and Materials

- pencil
- graph paper

Steps

1. Identify five different hobbies among your classmates.
2. Collect information on the number of pupils for each hobby.
3. Record the information as in Table A.
4. Transfer the information in the table to another form of communication creatively.

Table A

Hobby	Number of pupils (person)
	
	
	
	
	

Question

Which is the most favoured hobby among your classmates?



Fun Activity Sketch a Face



Apparatus and Materials

- pencil
- A4 paper

Steps

1. Observe your friend's face.
2. Sketch your friend's face on an A4 paper.
3. Label each part of the face that you have sketched.
4. Present your sketch in front of the class.

Question

Besides sketching, suggest other forms of communication.

TEACHER'S NOTES

- Other forms of communication include drawing posters, picture charts, pie charts, and storytelling.

Activity Book
Page:

9

Manipulative Skills

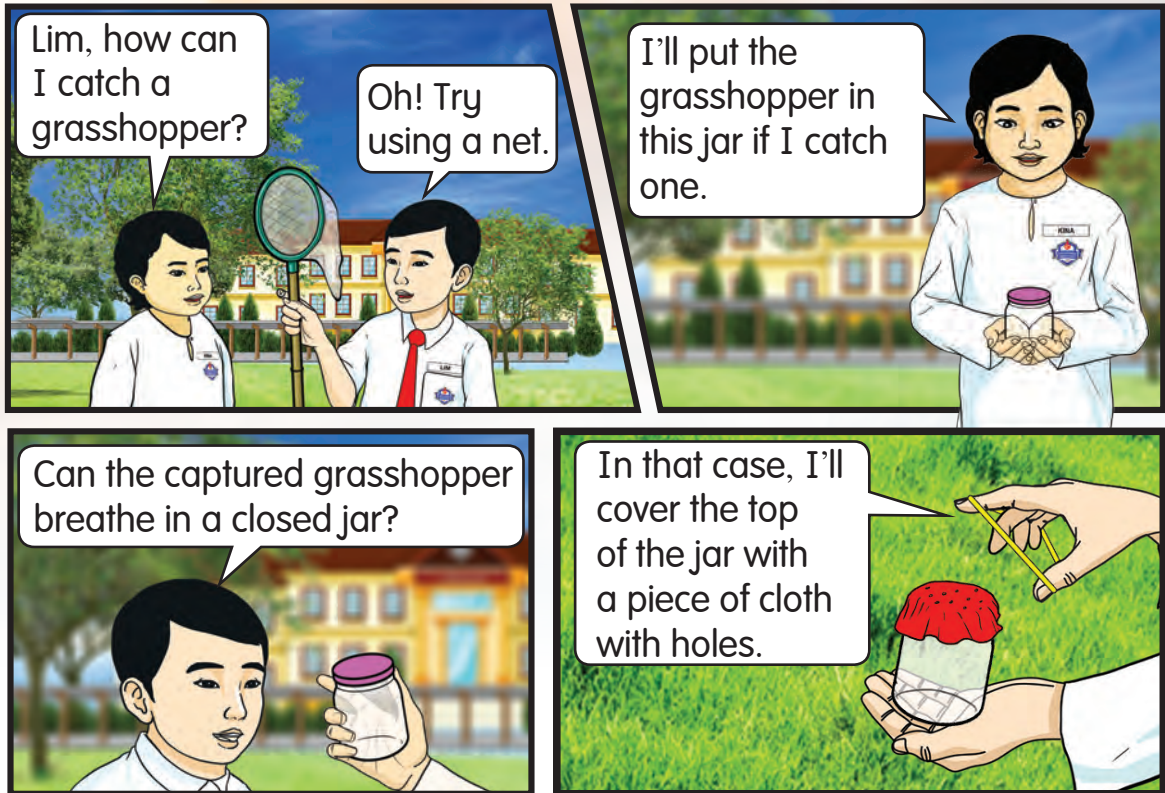
Manipulative skills refer to psychomotor skills used in a scientific investigation.



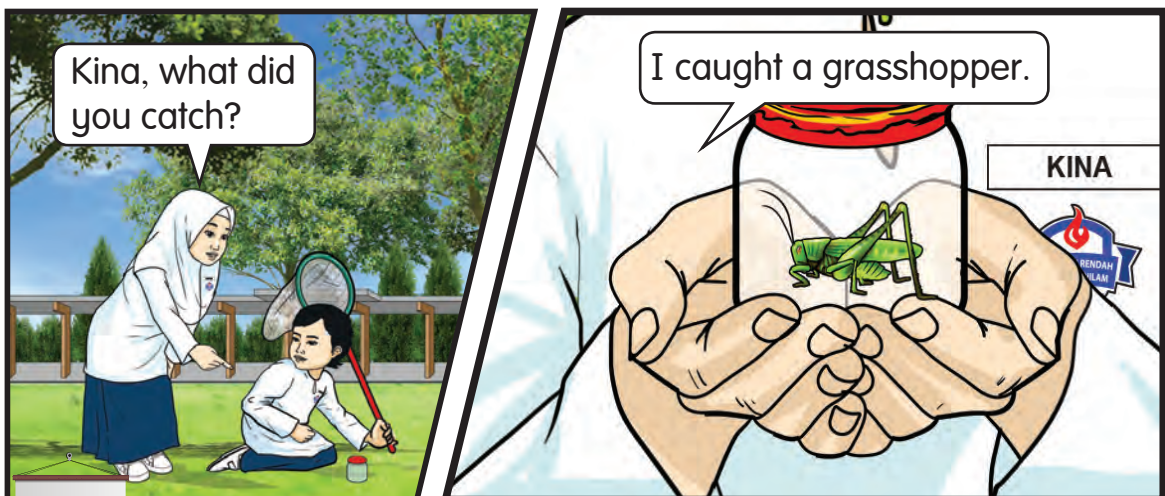
What manipulative skills do you observe in the situation above?

Using and Handling Science Apparatus, Substances, and Specimens

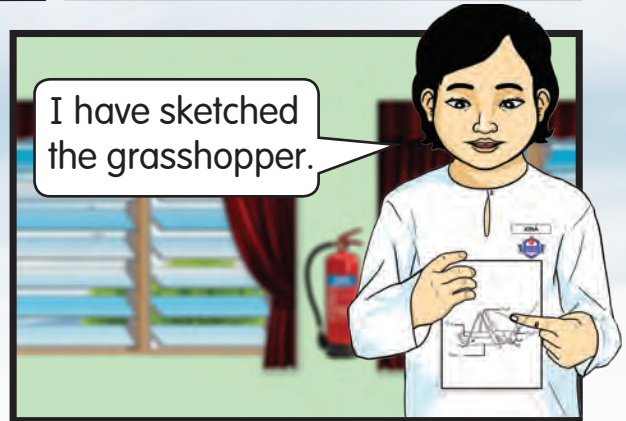
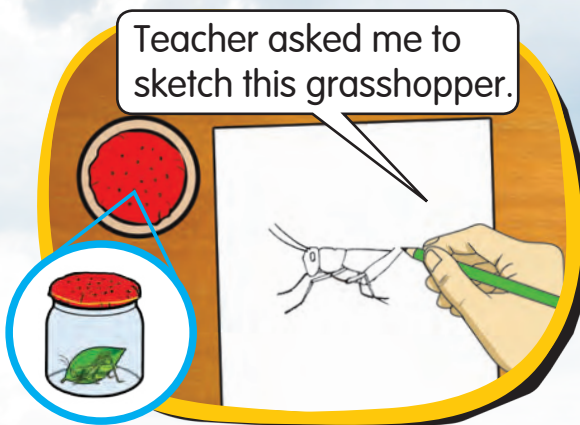
Kina and Lim want to carry out a scientific investigation. Let us read their conversation.



Suddenly, at the field...



1.2.1
1.2.2



What should Kina do with the grasshopper?



Fun Activity

Dragonfly, Oh Dragonfly!

Apparatus and Materials

- hand lens
- net
- jar
- rubber band
- cloth with holes
- dragonfly

Steps

1. Capture a dragonfly in the Science Garden using a net.
2. Put the dragonfly in the jar. Cover it using a cloth with holes.
3. Observe the dragonfly using a hand lens. Sketch it in the Science exercise book.
4. Release the dragonfly.

Question

Why do we use a hand lens in this activity?



1.2.1
1.2.2
1.2.3
1.2.4
1.2.5

TEACHER'S NOTES

- The dragonfly may be replaced with another specimen such as a butterfly, cockroach, ant or other insects.

Activity Book
Pages:

10-11

Sketching

Sketching is a method to record information in the form of a diagram. The sketch should be clear, accurate, and labelled.

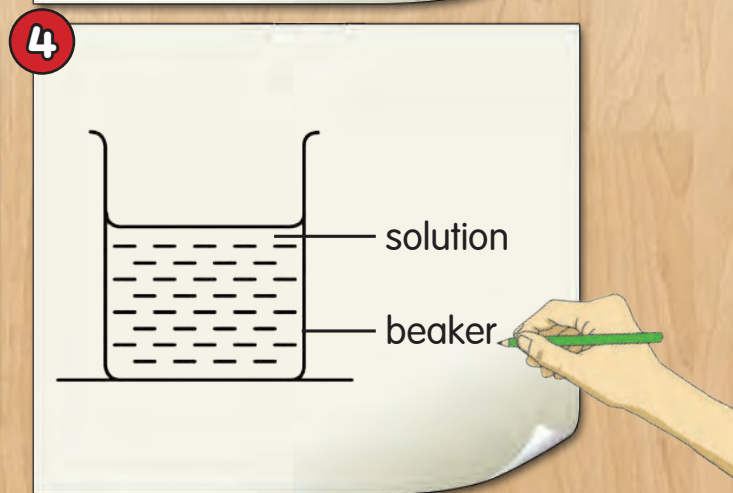
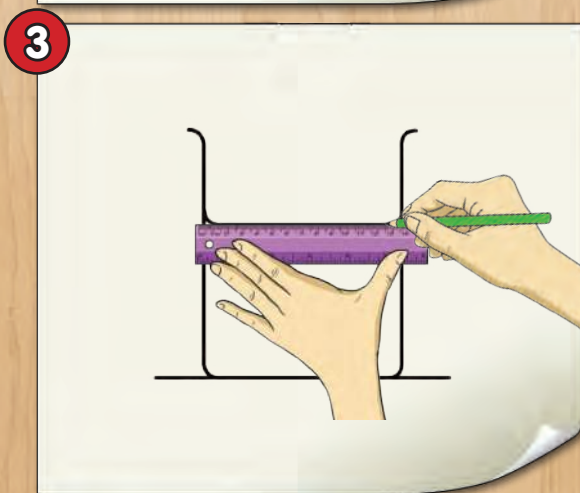
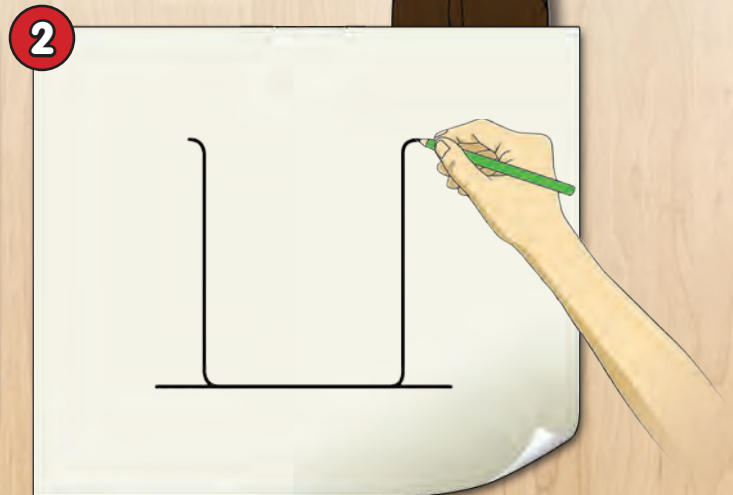
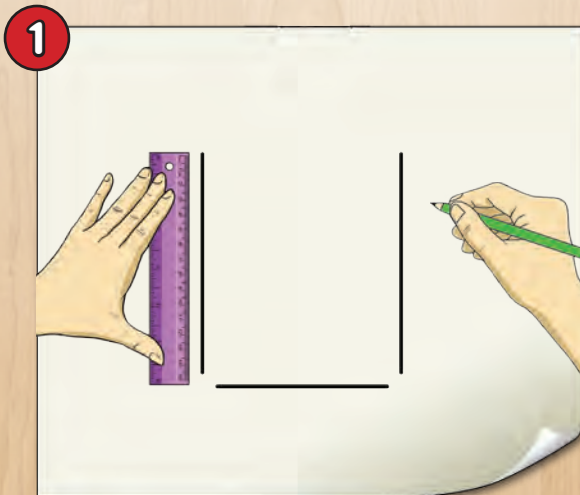


Teacher, I have learnt to sketch a specimen. How do I sketch a science apparatus?

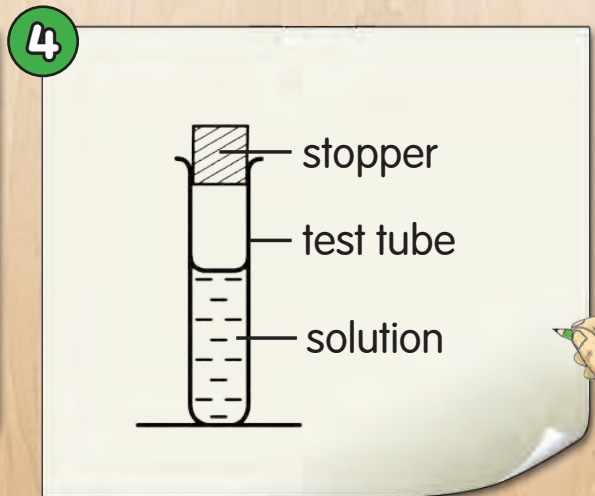
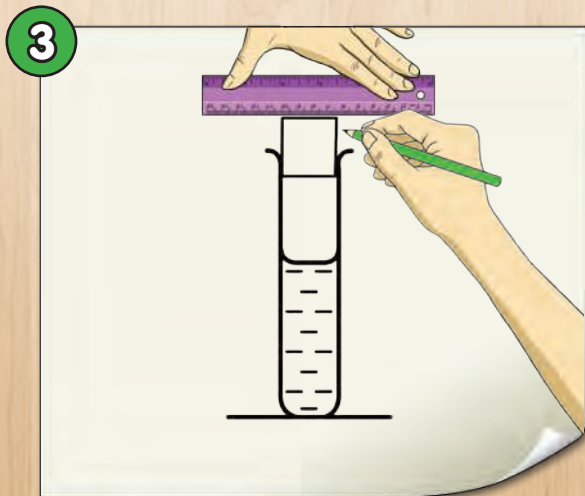
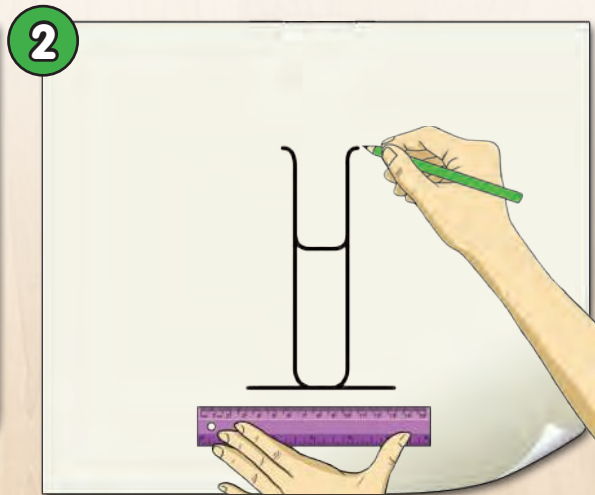
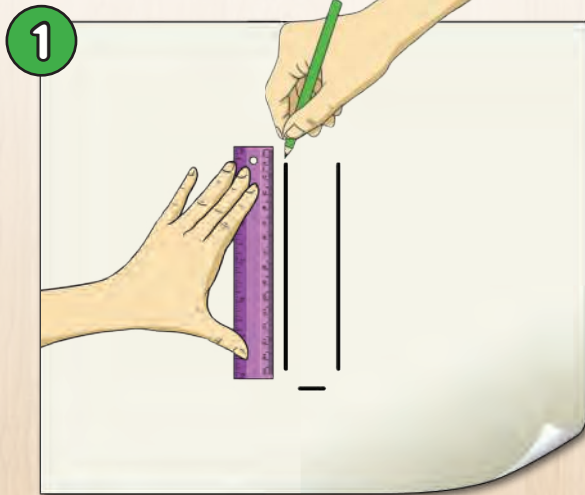


Let's look at the example below.

A Sketching a Beaker



B Sketching a Test Tube



Use me to draw straight lines.



Every sketch should be labelled correctly.



Cleaning and Storing Science Apparatus

After completing a science investigation, we must clean, dry, and store the science apparatus correctly.



Fun Activity

Sketch It Right

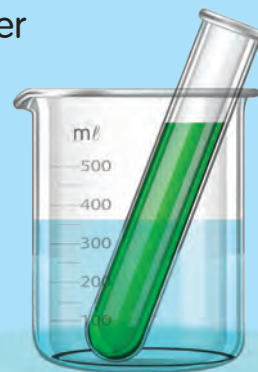


Apparatus and Materials

- test tube
- beaker
- ruler
- pencil
- A4 paper
- coloured solution
- 300 ml of water

Steps

1. Pour the coloured solution into the test tube.
2. Put the test tube inside the beaker that is filled with 300 ml of water.
3. Sketch the test tube in the beaker according to the diagram shown.
4. Label the sketch.
5. Clean the test tube and beaker. Then, store them.




1.2.3
1.2.4
1.2.5



Leisure Science **Magical Balloon**

Steps

1. Attach a balloon to the rim of the bottle.
2. Put the bottle in a container filled with ice cubes.
3. Observe the result.
4. Predict what would happen to the balloon if it is put in a container filled with hot water.  **Caution**



What was the result?
Did you make a correct prediction?



Let's Remember

1. Science Process Skills

- observing
- classifying
- measuring and using numbers
- making inference
- predicting
- communicating

2. Manipulative Skills

- Use and handle science apparatus and substances correctly.
- Handle specimens correctly and with care.
- Sketch specimens and science apparatus correctly.
- Clean science apparatus correctly.
- Store the science apparatus and substances correctly and safely.



Let's Answer


Answer all the questions in the Science exercise book.

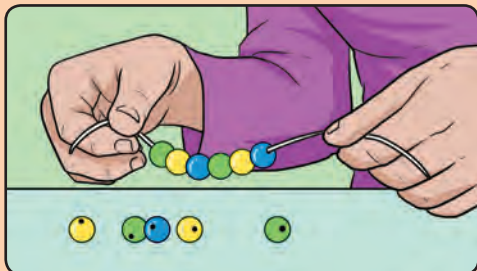
1. What are the senses used to make an observation of the durian?




2. What characteristics do these animals share?



3. A ruler is an apparatus that we use to measure  in centimetres.
4. Aishah is making a bracelet using multicoloured beads. Predict the colour of the next bead.



5. Make an inference about a torch that does not have light.
6. Information and data may be presented in various forms such as a table, , diagram or model.
7. State **true** or **false** for the following statements:
 - (i) We should throw specimens in the sink.
 - (ii) We should use wooden tongs to hold a hot test tube.
 - (iii) We should use specimens in large quantities.
 - (iv) We should label each sketch of the science specimens, apparatus, and substances.
8. What must be done after completing a science investigation?



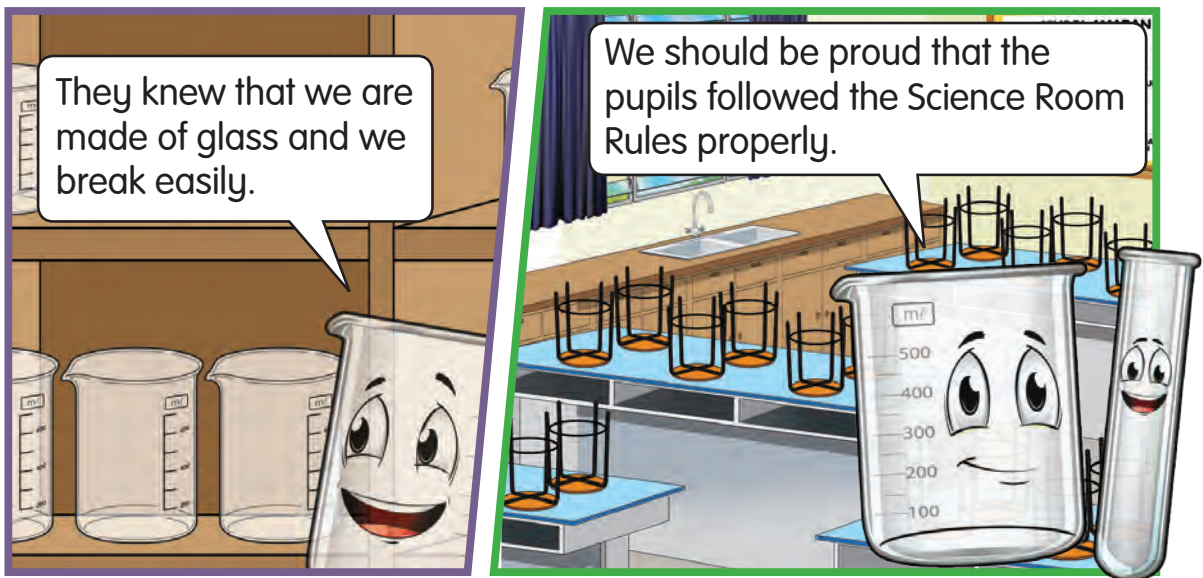
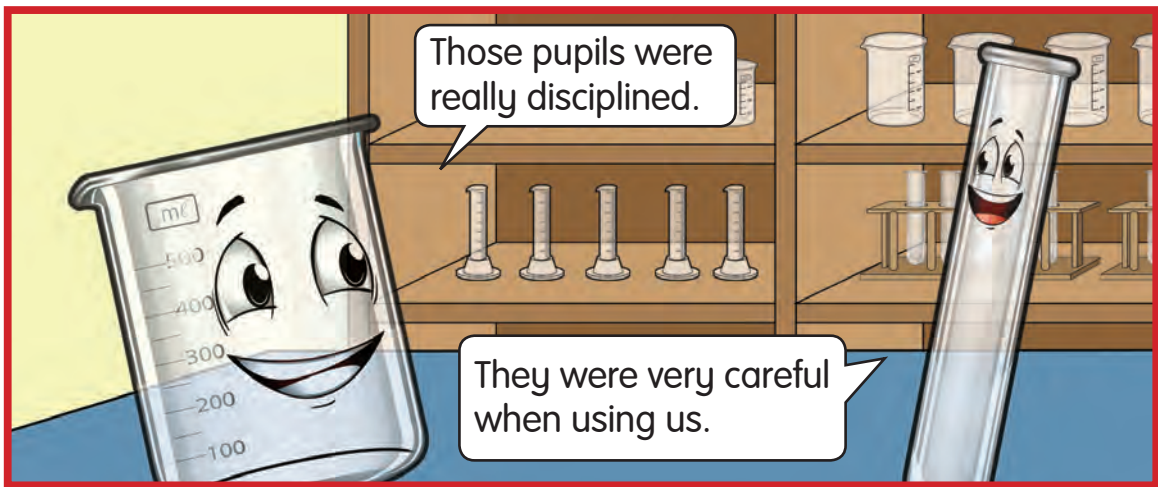
HOTS

Your friend threw soil specimen in the sink. What should you do? Why?

Unit 2

SCIENCE ROOM RULES

After the Year 3 pupils had left the Science Room, Mr Beaker and Ms Test Tube discussed the activities carried out by the pupils.



What would happen if the pupils were not careful when using the glass apparatus in the Science Room?

Adhere to Science Room Rules

The Science Room Rules must always be practised and followed. What are the Science Room Rules that must be adhered to?

Open all doors and windows before starting any activity

Why must we open all the doors and windows when we are in the Science Room?

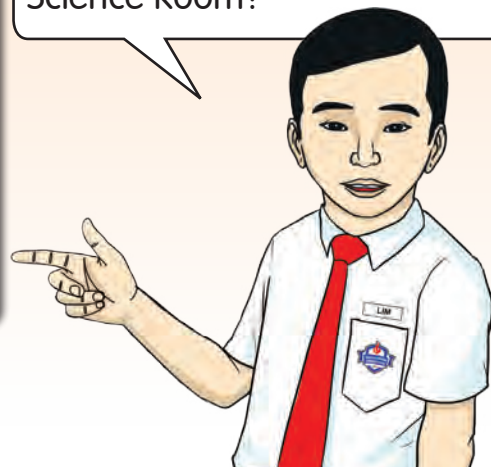


Wear shoes that cover the feet

Hey! You're not wearing shoes! It's not safe when we're in the Science Room.

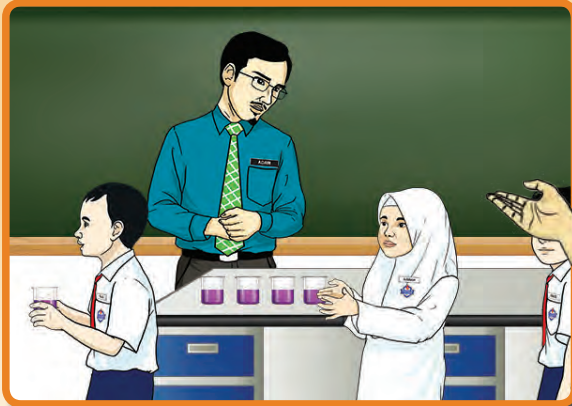


Wearing shoes is also one of the school rules. Why do we need to always wear shoes in the Science Room?



2.1.1

Take science apparatus in a proper and careful manner



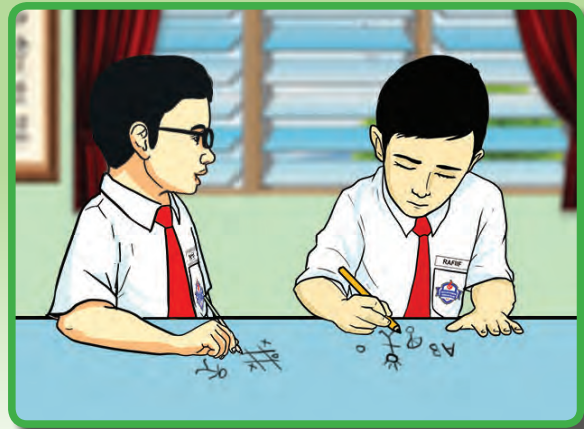
What would happen if all the pupils rushed to take their science apparatus?



Handle equipment and apparatus with care



What would you do if you saw such situation?



Switch off all fans and lights before leaving the Science Room



Why must we switch off all the fans and lights before leaving the Science Room?



Activity Book
Pages:

15-16

Do I Adhere to the Science Room Rules?

Science Room Rules help to inculcate self-discipline. It should be practised in our lives.

Do you always adhere to the Science Room Rules?














Let's take a look at the Science Room Rules checklist.



Do I Adhere to the Science Room Rules?

Tick the rules that you have practised.

1. I line up before entering the Science Room. 
2. I wear shoes that cover my feet in the Science Room. 
3. I do not eat or drink in the Science Room. 
4. I leave my bag outside the Science Room. 
5. I open the doors and windows when I am in the Science Room. 
6. I do not run around or play in the Science Room. 
7. I take the science apparatus in a proper and careful manner. 
8. I do not carry out any activity without the teacher's instruction. 
9. I quickly inform the teacher about any injury or broken science apparatus. 
10. I clean all science apparatus after use. 
11. I switch off all the fans and lights before leaving the Science Room. 

Signature:

.....

Name:

Date:

TEACHER'S NOTES

- Ask pupils to rewrite the checklist in their Science exercise book.

Activity Book
Pages:

15-16



Steps

1. Make a fan using any materials based on your own creativity.
2. Type and print all the Science Room Rules that you have learnt. Then, paste them on the fan.



Let's Remember

Science Room Rules

1. Before Activity

- Open all doors and windows when you are in the Science Room to allow light and air flow.
- Wear shoes that cover the feet to prevent injury in the Science Room.

2. During Activity

- Take science apparatus in a proper and careful manner to prevent the apparatus or substance from falling.
- Do not scribble on the tables and break any science apparatus to ensure the Science Room is neat and tidy.

3. After Activity

- Switch off all fans and lights before leaving the Science Room to avoid from wasting electricity.

Let's Answer

Answer all the questions in the Science exercise book.

Let us learn and play by answering the following questions.

Instructions

1. Start answering the questions from the bottom.
2. If the answer is correct, move up one level.
3. If the answer is wrong, please revise to get the correct answer.
4. Continue answering until you reach the top.



HOTS

Where can we practise the Science Room Rules apart from the Science Room?



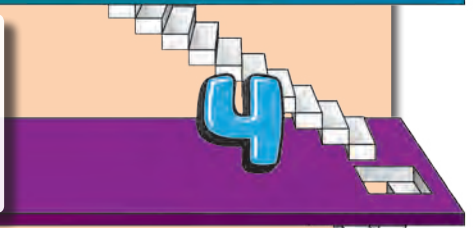
CONGRATULATIONS

You see a friend using a broken science apparatus. What should you do?

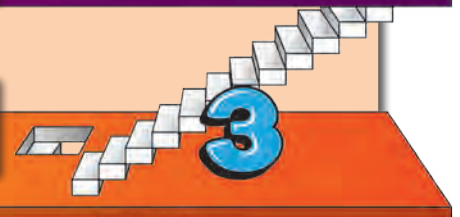


The teacher asks each pupil to pick up a hand lens and a specimen.

What would happen if:
(i) the pupils rush? (ii) the pupils line up?



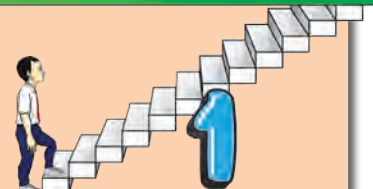
Can we sketch a specimen on the surface of a table in the Science Room? Why?



What would the situation inside the Science Room be if all the doors and windows are closed?

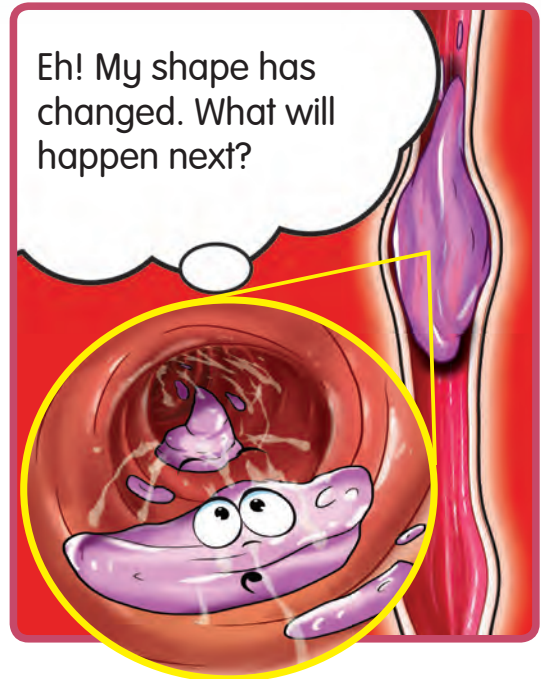
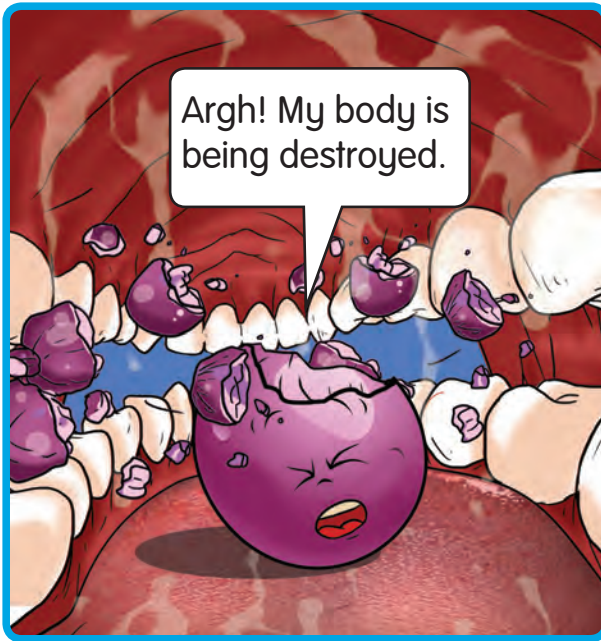
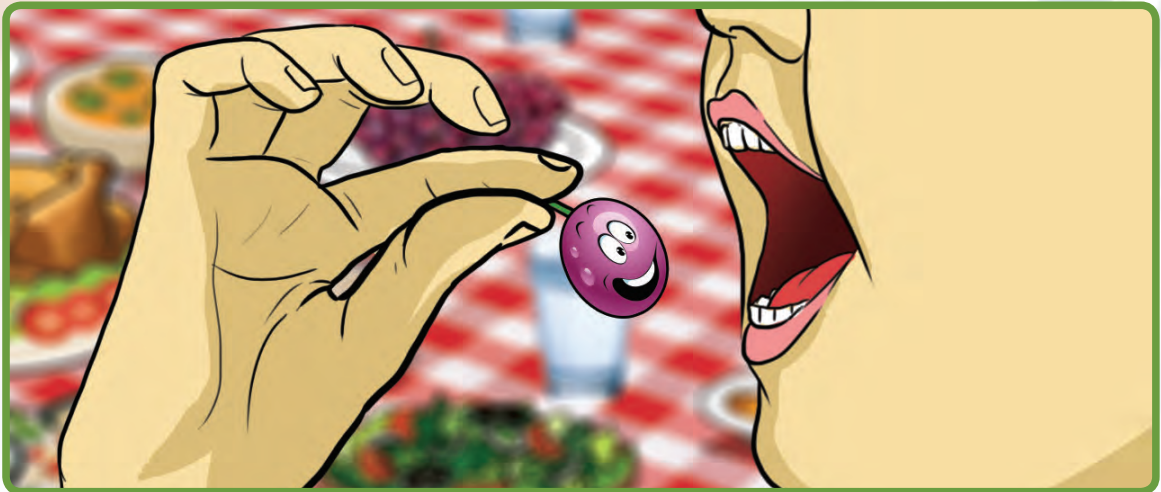


State five Science Room Rules that you must practise.



START

Kina is eating a grape. What will happen to the grape?



How does the shape of the grape change?

Types of Teeth and Their Functions

We have three types of teeth. Let us find out about these teeth and their functions.



canines



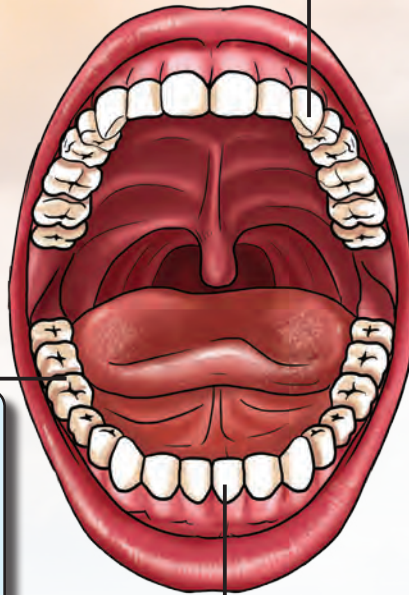
Function:
to tear food



molars



Function:
to grind food



incisors



Function:
to cut food

Let's Get to Know Our Teeth Song

Our incisors to chop and cut,
Our canines to tear apart,
Our molars to grind the food,
We use all of them to chew our food.

Every little tooth helps us to talk,
And make our smile so cute and sweet,
These are the functions of our teeth.

(To the tune of Papaku Pulang)

Ngap, ngap, ngap, ngap, ngap,
Ngap, ngap, ngap, ngap



Activity Book
Pages:

17-19



3.1.1



Fun Activity Knowing the Functions of the Teeth



Apparatus and Materials

- plastic ruler
- pencil
- bottle
- tile
- a piece of mustard leaf stalk

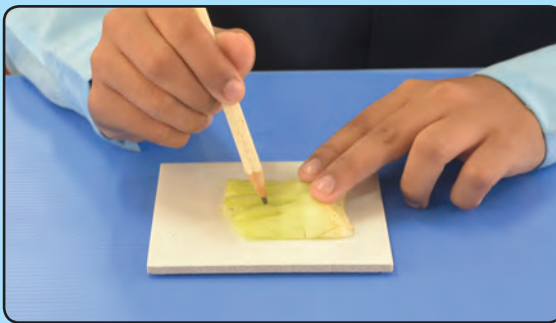
Steps

1.



Cut the mustard leaf stalk using a plastic ruler. Observe the result.

2.



Using a pencil, pierce the mustard leaf stalk. Then, **tear** it apart. Observe the result.

3.



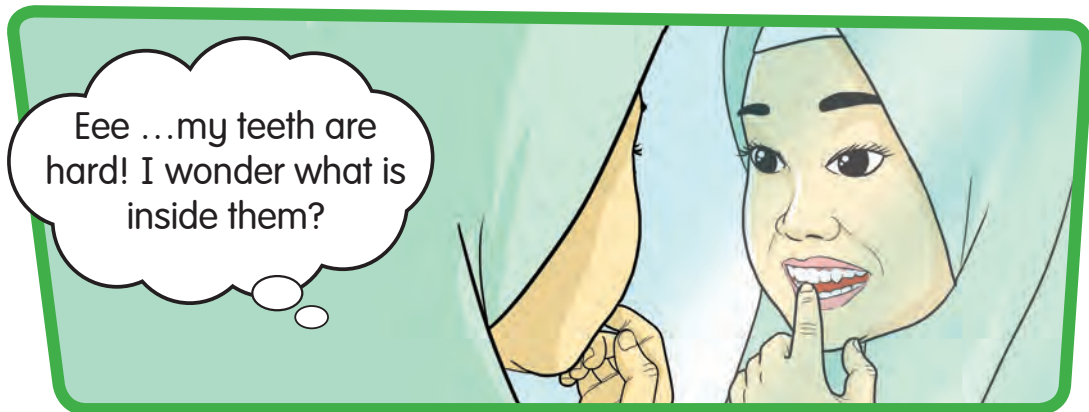
Grind the mustard leaf stalk using a bottle until it is ground. Observe the result.

Questions

1. What do the ruler, pencil, and bottle represent?
2. Based on the activity, describe the function of each type of teeth.

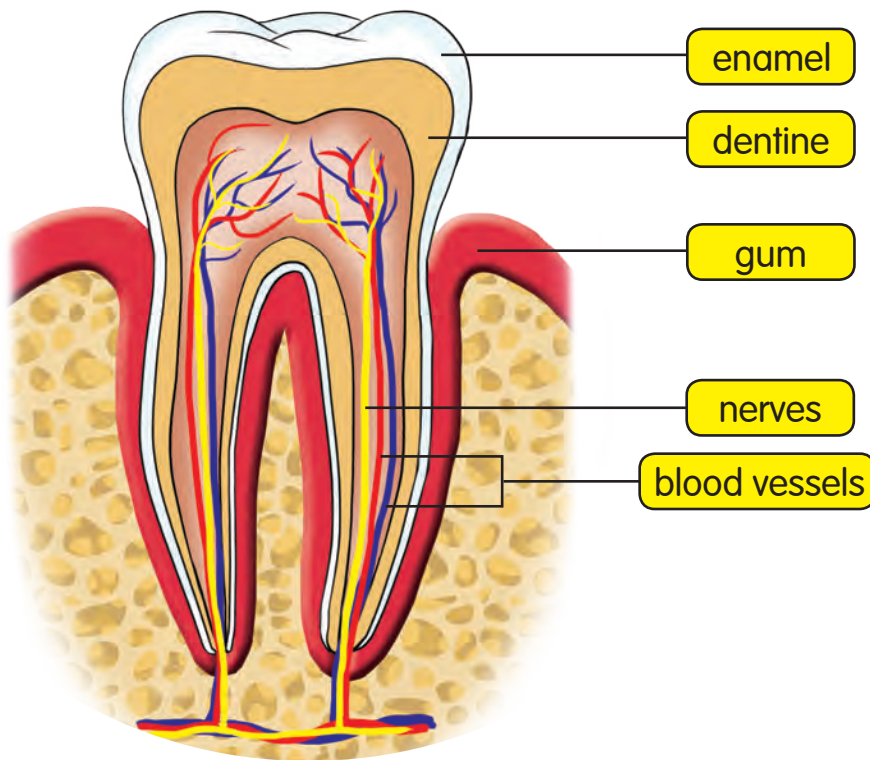
Structure of a Tooth

Aishah is observing her teeth in a mirror.



If we take a cross section of a tooth, what can we observe?
Let us look at the structure of a tooth below.

Cross Section of a Tooth





Fun Activity

Labelling the Structure of a Tooth

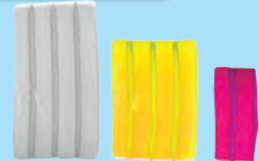


Apparatus and Materials

- plastic ruler
- rolling pin
- red, blue, and yellow threads





- a piece of a plastic bottle





- white, yellow, and red clay

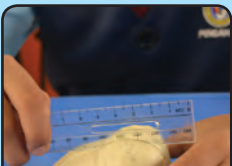
Steps


1.  Flatten the white and yellow clay using the rolling pin.

2.  Put the flattened white clay and then the yellow clay into the piece of a plastic bottle. Press them together.

3.  Shape the red clay into a letter 'U' and put it on top of the flattened yellow clay.

4.  Wrap the U-shaped red clay with the flattened yellow and white clay.

5.  Cut the tooth model in half using the plastic ruler.

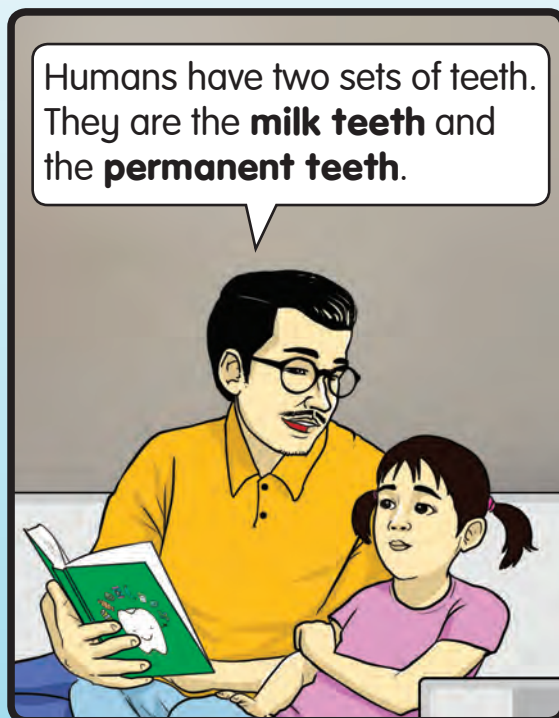
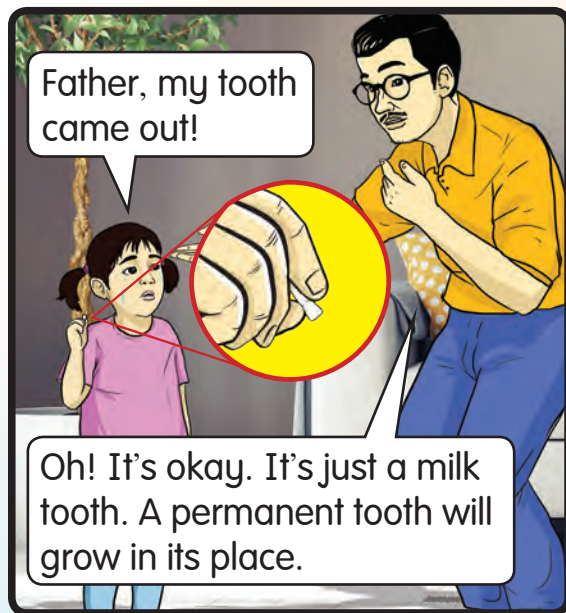
6.  On the cross section of the tooth model, place red and blue threads for the blood vessels, and yellow thread as the nerves. Label all of them.

Question

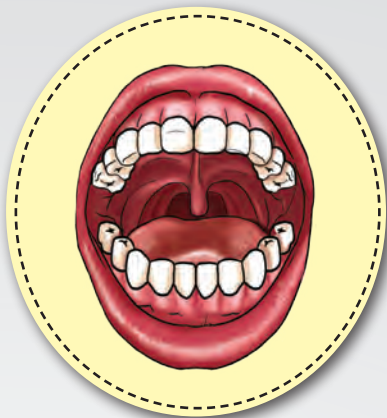
Based on the activity above, which structure is missing from the tooth model?

Milk Teeth and Permanent Teeth

Let us observe the situation below.



Milk Teeth Set and Permanent Teeth Set



Milk Teeth Set

There are 20 teeth, which are:

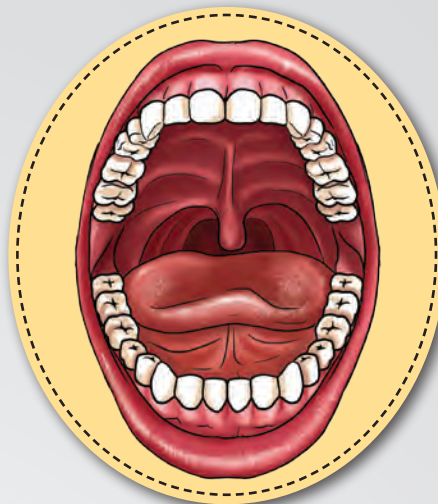
- 8 incisors
- 4 canines
- 8 molars

Thin layers of enamel and dentine.

Teeth are smaller and not strong.

Teeth are not permanent and have a short life span.

Milk teeth start to grow at 6 months old and are complete at 3 years old.



Permanent Teeth Set

There are 32 teeth, which are:

- 8 incisors
- 4 canines
- 20 molars

Thick layers of enamel and dentine.

Teeth are bigger and stronger.

Teeth are permanent and have a long life span.

Permanent teeth start to grow at 6 years old and are complete at 21 years old.

Both sets have the same types of teeth, which are incisors, canines, and molars.



Activity Book
Page:

21



Fun Activity

Compare and Contrast between Milk Teeth and Permanent Teeth

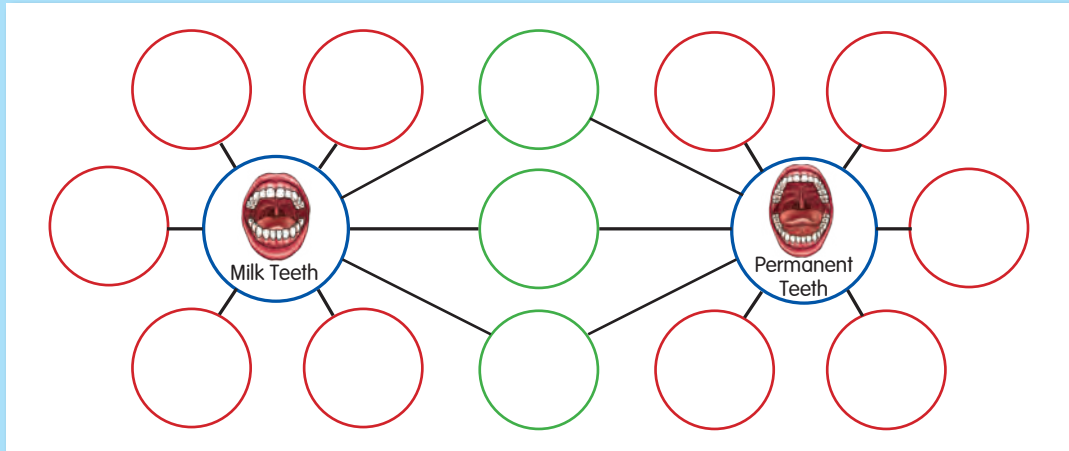


Apparatus and Materials

- glue
- A4 paper
- pictures of milk teeth and permanent teeth
- scissors
- marker pens

Steps

1. In pairs, each pupil finds information about a different set of teeth.
2. Compare the information about the sets of teeth with his/her partner.
3. Identify the differences and similarities between the milk teeth set and the permanent teeth set.
4. Produce a double bubble map about both sets of teeth as shown below.



5. Present the double bubble map in front of the class.

Question

Do both sets of teeth have the same structure?



HOTS

What would happen if humans had a milk teeth set only?

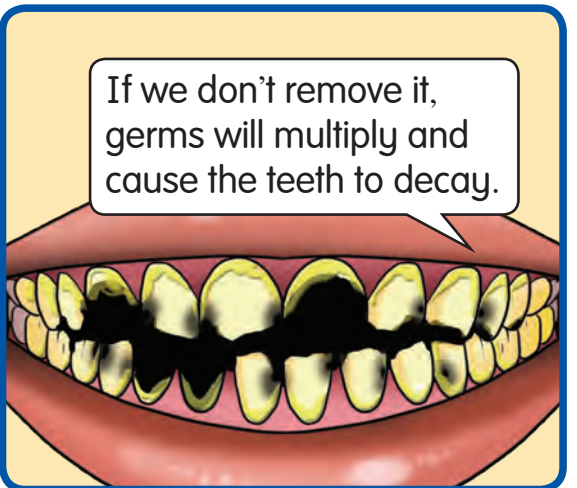
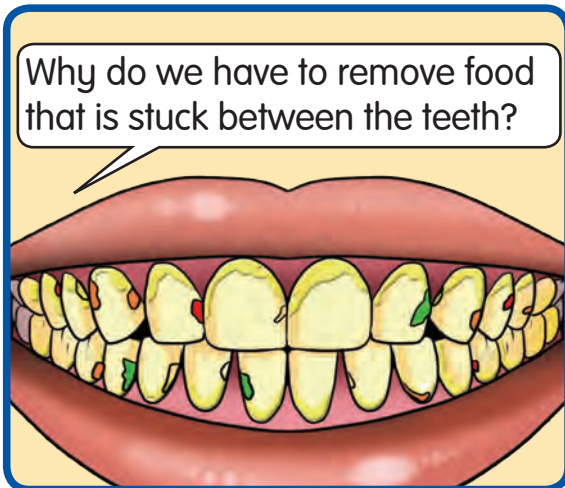
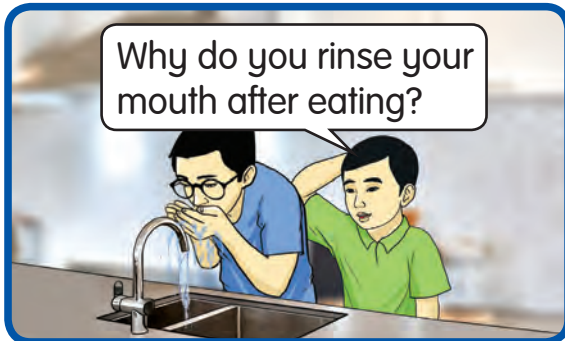
TEACHER'S NOTES

- The activity above is carried out using the Think-Pair-Share method of the 21st Century Learning Skills.

3.1.3
3.1.5

Dental Care

Lim and his brother have just finished their lunch.





To floss your teeth, put the floss between your teeth and move it back and forth repeatedly to remove the food that is stuck.



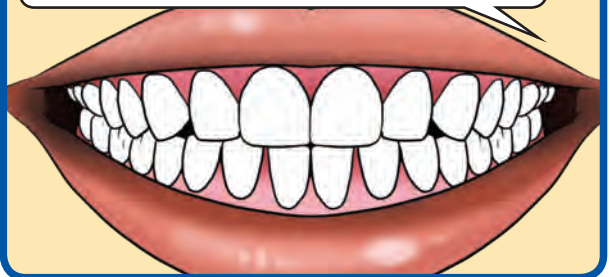
If you always eat sweet food and don't clean your teeth, the teeth will decay.



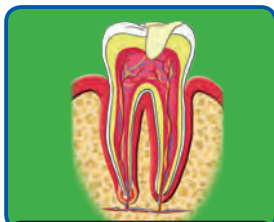
We should go to the dentist for a check-up once every six months.



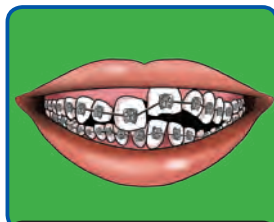
If we practise good dental care, our teeth will be healthy and beautiful.



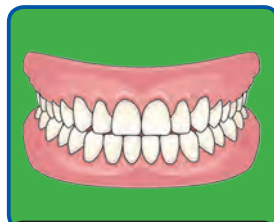
Why is daily dental care important to us? Can you explain? There are many dental care technologies that are available, such as:



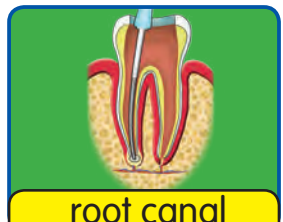
fillings



braces



dentures



root canal treatment

Find out more about these technologies and present them creatively to the class.



Fun Activity

It's Easy to Clean Our Teeth

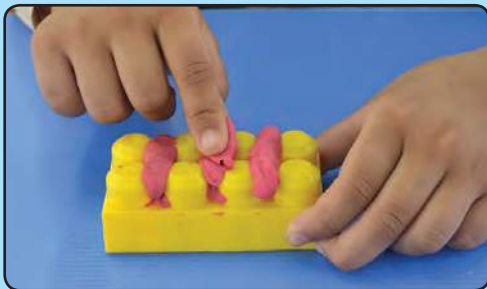


Apparatus and Materials

- toy brick
- thread
- clay
- toothbrush

Steps

1.



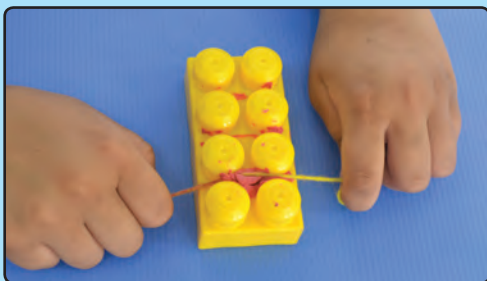
Put clay between the studs of the toy brick.

2.



Use a toothbrush to remove the clay between the studs. Can you remove all of the clay? Why?

3.



Put the thread between the studs and move it back and forth repeatedly. Can you remove all of the clay? Why?

Questions

1. What do the toy brick, clay, and thread represent?
2. Why must we floss and brush our teeth every day?

Classes of Food

Food can be classified into seven groups which are carbohydrate, protein, fats, minerals, vitamins, fibre, and water.



Can you give other examples for each class of food?





Fun Activity

Classifying Food

Apparatus and Materials

- mahjong paper
- A4 paper
- marker pen



- seven pictures of different meals

Steps



1. Each group receives a picture of a meal.



2. Identify the class of each type of food in the meal.



3. Build a tree map of Classes of Food on the mahjong paper.



4. Display the work to the class.

Question

Which class of food have you identified the most?

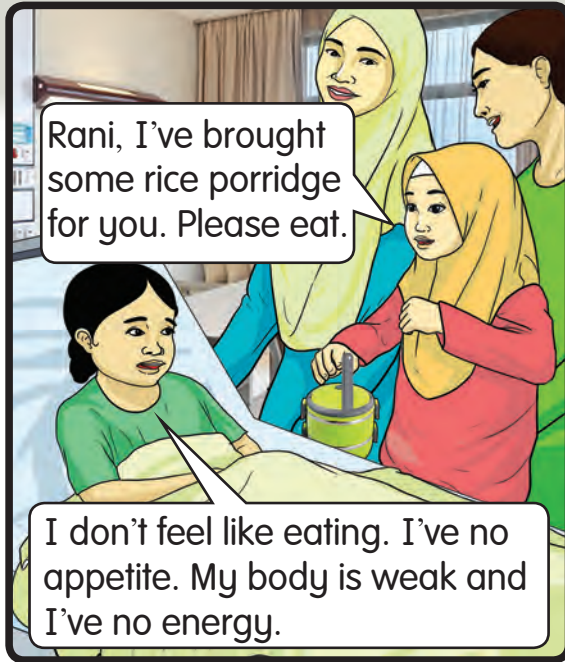


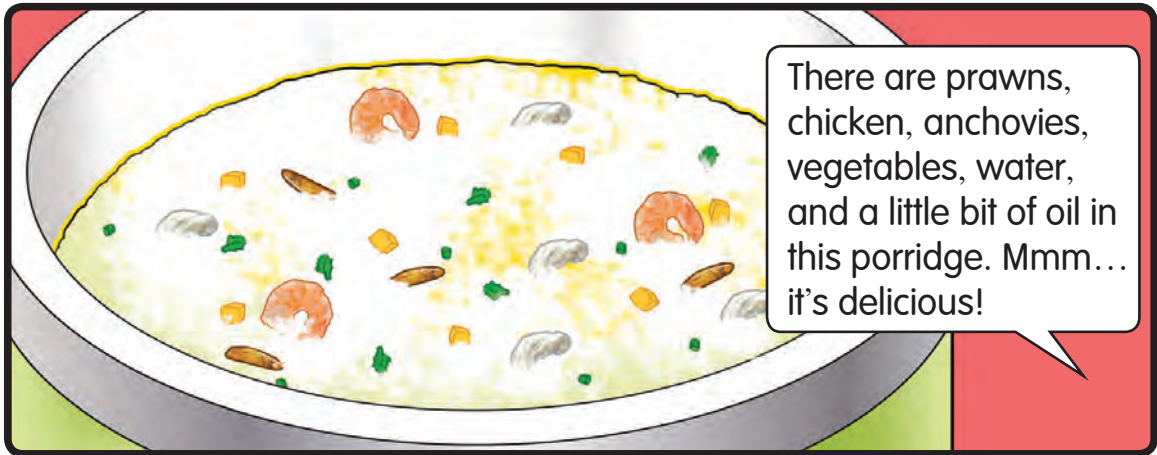
TEACHER'S NOTES

- The activity above is carried out using the Gallery Walk of the 21st Century Learning Skills.
- Teachers should choose meals that include all the seven classes of food.

The Importance of My Food

Aishah visits Rani at the hospital.





Each class of food is important for our bodies as it helps us to stay healthy.

THE IMPORTANCE OF FOOD

<p>Protein</p> <p>For growth</p>	<p>Carbohydrate</p> <p>Provides energy</p>	<p>Vitamins</p> <p>Keep us healthy</p>	<p>Minerals</p> <p>Keep us healthy</p>
<p>Fats</p> <p>Warm the body</p>	<p>Water</p> <p>Regulates body temperature</p>	<p>Fibre</p> <p>Prevents constipation</p>	

How does the porridge help Rani to get well again? Explain.

A Balanced Diet

How can we make sure that the meal we eat is balanced?

We can make sure that the meal we eat is balanced by following the Malaysian Food Pyramid.



Malaysian Food Pyramid

Level 4: Eat Less

(fat, oil, salt, and sugar)



Level 3: Eat in Moderation

(fish, poultry, meat, legumes, milk, and dairy products)



Level 2: Eat Plenty

(fruits and vegetables)



Level 1: Eat Adequately

(rice, noodles, cereal, cereal products, and tubers)



(Source: Ministry of Health Malaysia)

3.2.3



A balanced diet is one that has all the classes of food in sufficient amounts.

Based on the Malaysian Food Pyramid, plan a balanced meal and explain it.


TEACHER'S NOTES

- The consumption of a balanced diet depends on gender, age, size of body, environment, level of health, and physical activity.

Activity Book
Page:
30



Apparatus and Materials

- manila cardboard
- marker pen
- scissors  **Caution:**
- glue



- supermarket flyers

Steps



1. Draw the shape of a pyramid on the manila cardboard.



2. Each member of the group selects a level from the Food Pyramid and cuts out relevant pictures of food from the flyers. Then, paste the pictures onto the pyramid.



3. Plan a meal that can be cooked with the food in the Food Pyramid.



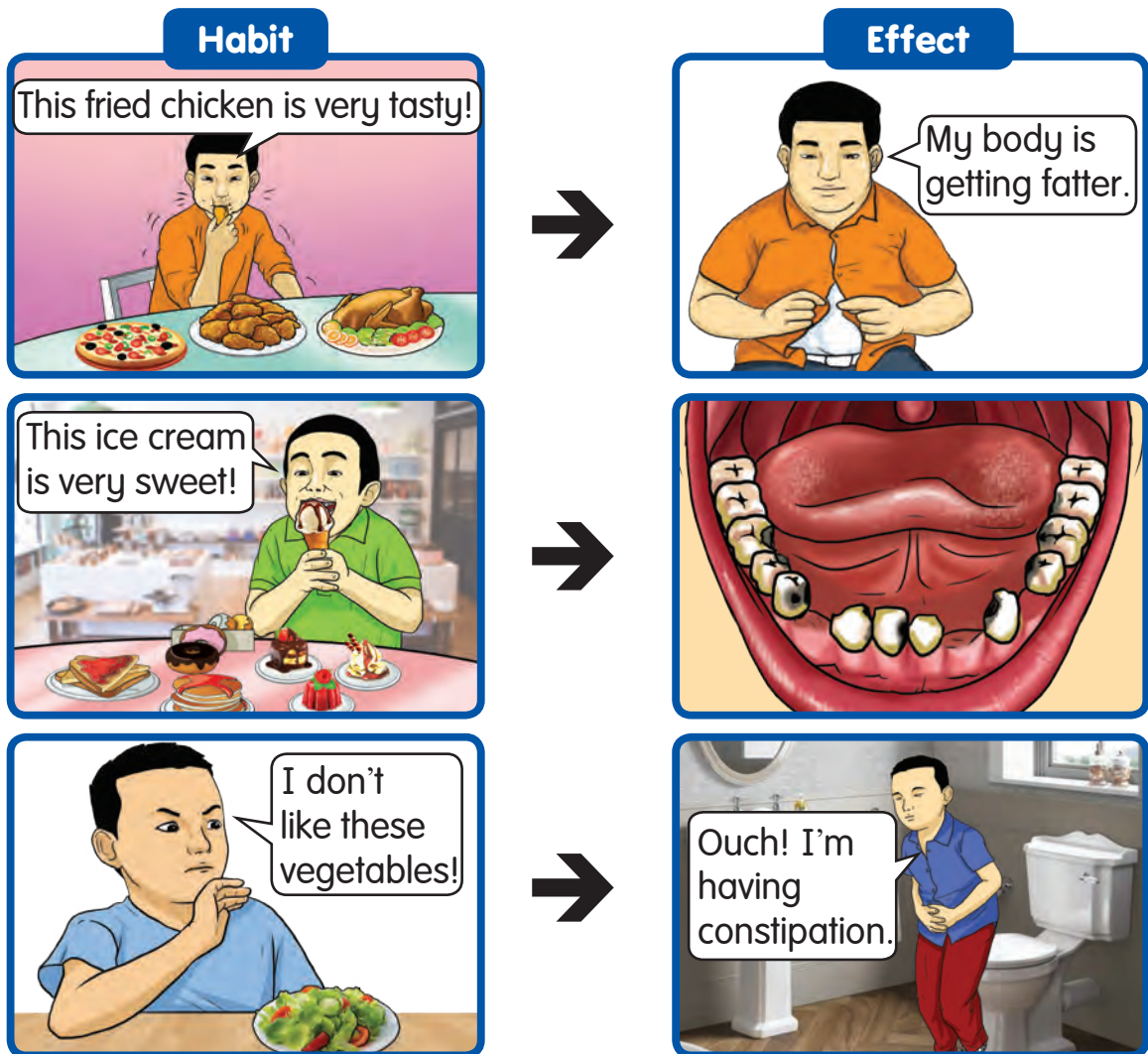
4. Present your work in front of the class.

Question

What meal do you plan to cook? Why?

The Effects of an Imbalanced Diet

Observe the situations below.



What are the effects of an imbalanced diet on the people who do not eat properly in the situations above?

Eating imbalanced meals can cause health problems. Therefore, we should plan the food we are going to eat based on the Malaysian Food Pyramid.



Apparatus and Materials

- A4 paper
- stationery

Steps

1.



Get information from various sources about the food we should avoid to prevent obesity.

2.



Based on your creativity, produce a health brochure using the information you have found.

3.



Present the health brochure in front of the class.

Question

If you were a doctor, what advice would you give to an obese patient about his/her eating habits?

The Digestion Process

An evening in Rani's kitchen.

This is so tasty! How does this hard biscuit become soft enough for me to swallow?

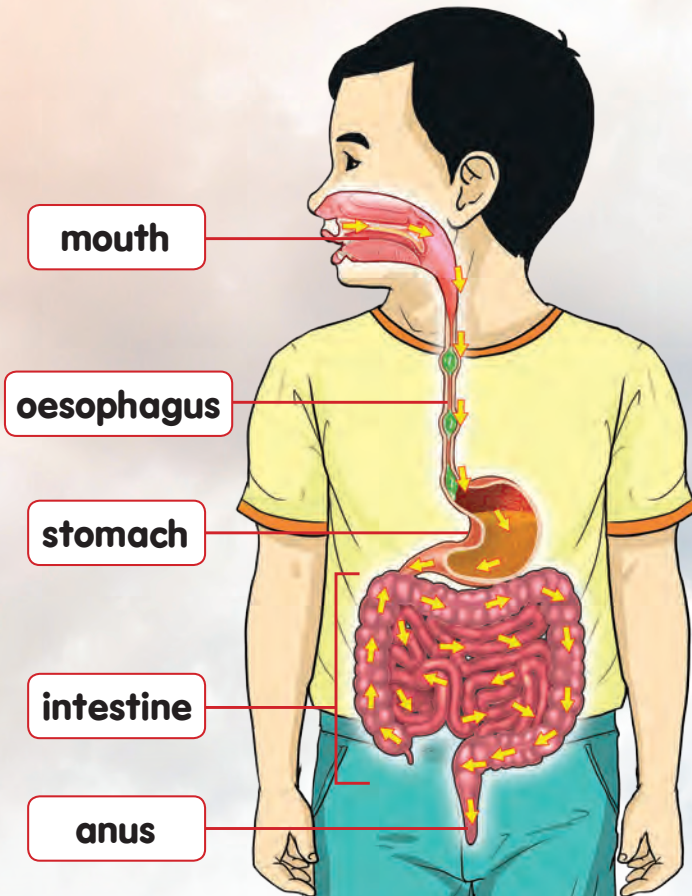
I've been broken down into small pieces by the teeth. The tongue and saliva make me soft and easy to be swallowed.

How is food broken down in our mouths?

3.3.1

The Flow of Food

The food that we eat will go through several parts of our body. Look at the diagram below.



Digestion Process Song

The digestion process,
Starts from the mouth,
We use our tongue and teeth,
And saliva too.

Chew and grind the food,
Until we can swallow,
Go through the oesophagus,
And to the stomach it goes.

From the stomach it slides,
Through the intestine,
And undigested food,
Exits through the anus.

(To the tune of
Anak Itik Tok Wi)

Based on the song above, state the flow of food during the digestion process.

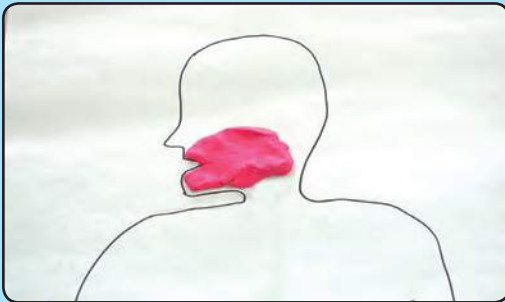




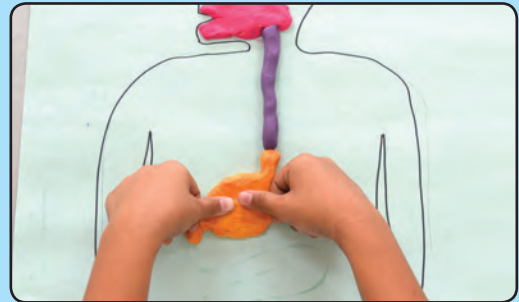
Apparatus and Materials

- clay of five different colours
- manila cardboard
- marker pen

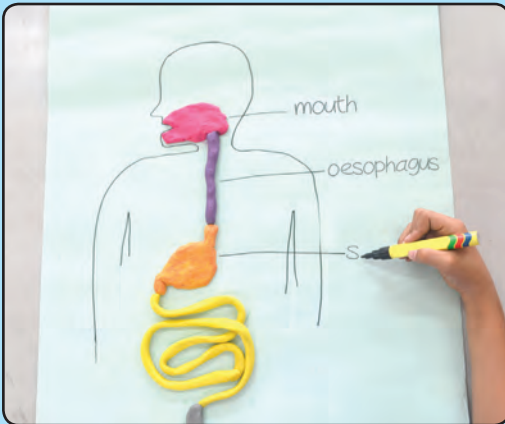
Steps



1. Form a digestive part using the clay.



2. Repeat step 1 using different coloured clay to form other digestive parts.



3. Label each digestive part using the marker pen.



4. Describe the digestive part model to your class.

Question

What is the flow of food inside our body during the digestion process?



TEACHER'S NOTES

- Teachers should sketch the shape of the human body on the manila cardboard.

Activity Book
Page:

34

Food Digestion

Let us continue the story about the grape that changed shape after being chewed and swallowed.

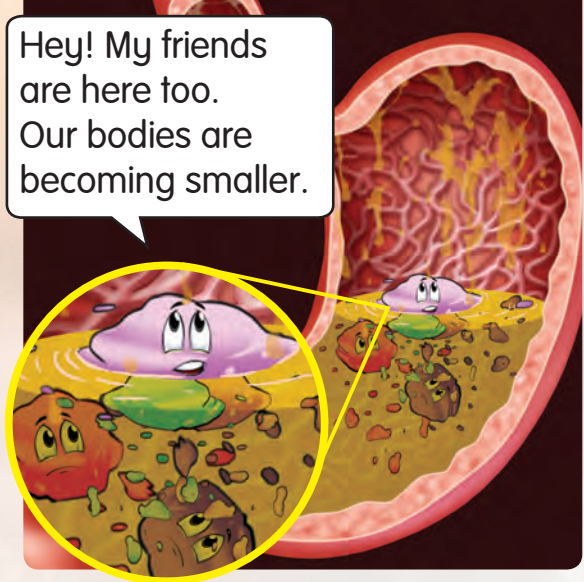
In the oesophagus

This passage is very narrow. Where will I be taken next?



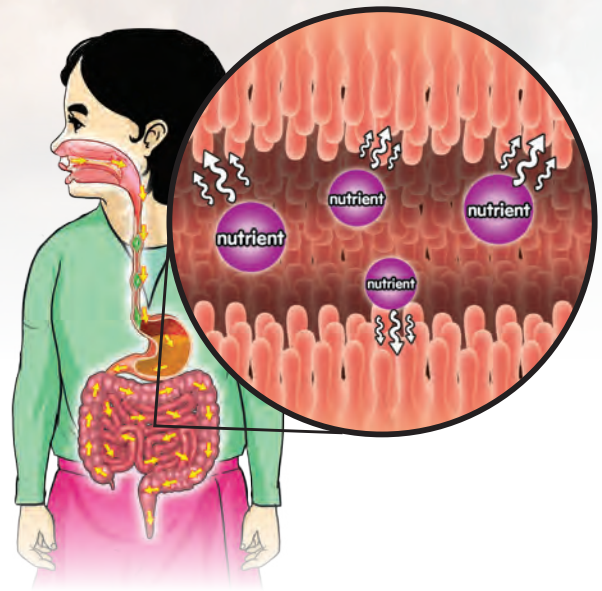
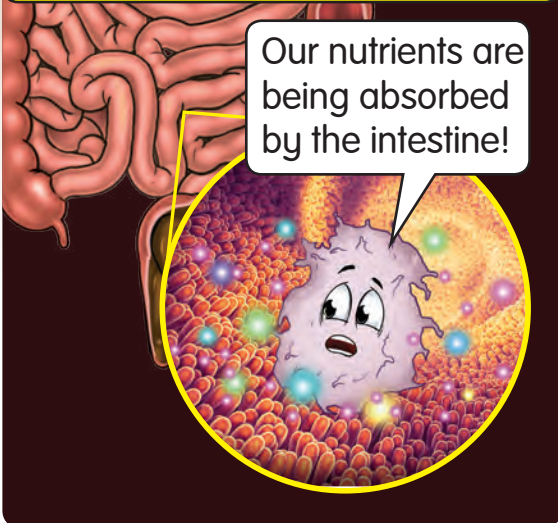
In the stomach

Hey! My friends are here too. Our bodies are becoming smaller.



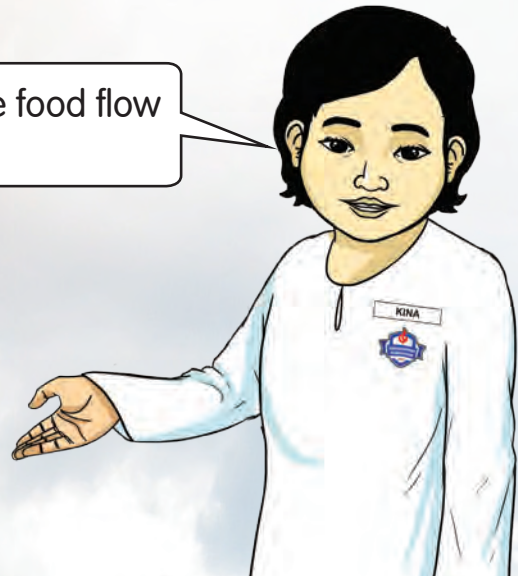
In the intestine

Our nutrients are being absorbed by the intestine!

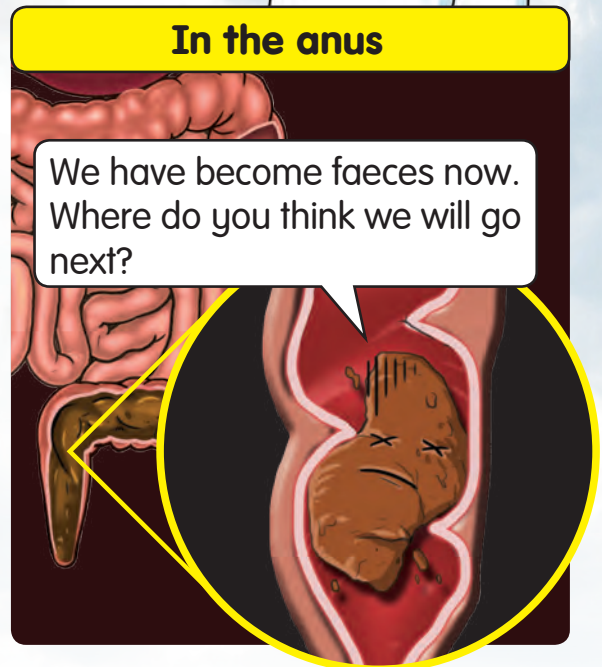
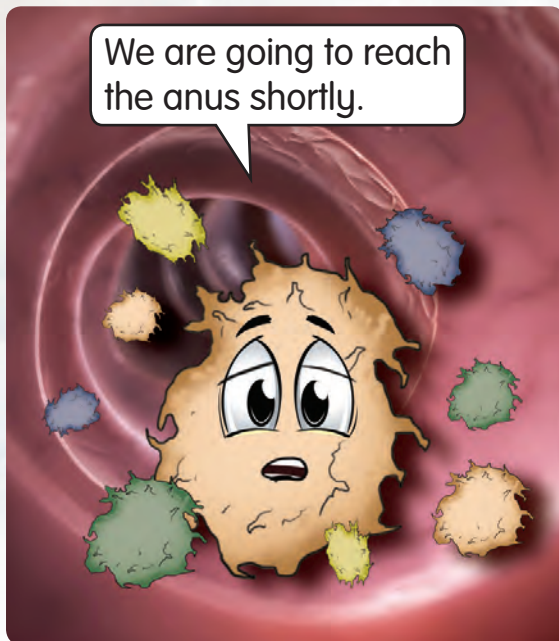


What happens to the grape and the other food?

Will all the digested food in the food flow be absorbed by the body?



Let us continue with the story.



What is your conclusion about the situation of the food that was eaten in the story?

Digestion is a process of breaking down food into smaller pieces so that its **nutrients** can be absorbed while moving through the food flow in the body.

TEACHER'S NOTES

- Faeces is also known as stool.

Activity Book
Pages:

33, 35

Actions that Disrupt Digestion

Observe the situations below.



Can you describe the actions and their effects on the digestion process based on the situations above?



Activity Book
Page:

36

3.3.4



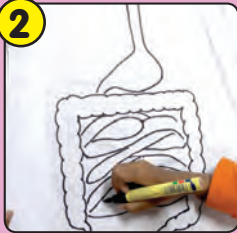
1



Steps

Creatively decorate an apron or a T-shirt with drawings of digestive parts using a colouring set.

2



3



Let's Remember

1. There are three types of teeth:



Incisors to cut food

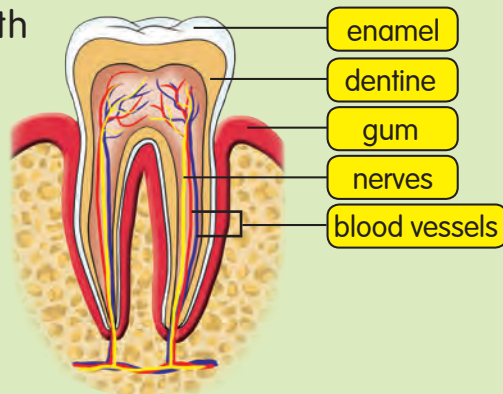


Canines to tear food



Molars to grind food

2. The structure of a tooth consists of:



3. Compare and contrast between the milk teeth and permanent teeth sets:

Milk Teeth Set	Permanent Teeth Set
20 teeth, which are: <ul style="list-style-type: none"> • 8 incisors • 4 canines • 8 molars 	32 teeth, which are: <ul style="list-style-type: none"> • 8 incisors • 4 canines • 20 molars
The layers of enamel and dentine are thin.	The layers of enamel and dentine are thick.
The teeth are smaller and not strong.	The teeth are bigger and stronger.
The teeth are not permanent. They have a short life span.	The teeth are permanent. They have a long life span.
Start to grow at 6 months old and will be complete at 3 years old.	Start to grow at 6 years old and will be complete at 21 years old.
Both sets have the same types of teeth which are incisors, canines, and molars.	

4. Dental care should be practised by everyone to keep teeth healthy and to avoid tooth decay.
5. Examples of dental treatments are fillings, braces, dentures, and root canal treatment.
6. There are seven classes of food, which are:

Food Class	Function
Carbohydrate	Provides energy
Protein	For growth
Fats	Warm the body
Vitamins	Keep the body healthy
Minerals	
Fibre	Prevents constipation
Water	Regulates body temperature

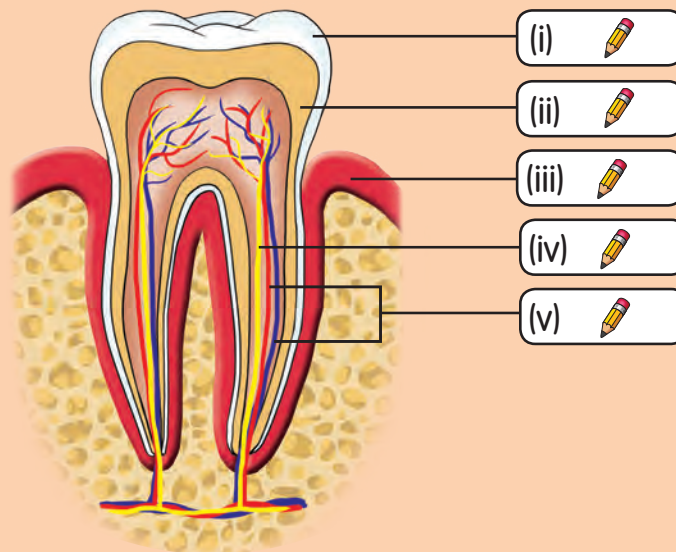
7. A balanced diet is one that includes all the seven classes of food based on the Malaysian Food Pyramid.
8. Digestion is the process of breaking down food into smaller pieces so that its nutrients can be absorbed by the body.

9. The food flow in the digestion process starts at the mouth, through the oesophagus, towards the stomach and intestine, and ends at the anus.
10. Actions that disrupt the digestion process can cause choking, vomiting, and stomach ache.

Let's Answer

Answer all the questions in the Science exercise book.

1. Name the types of teeth and describe their functions.
2. Label the structures of a tooth below.



3. State the differences and similarities between the milk teeth set and the permanent teeth set.
4. After eating, food may be stuck between the teeth. What are the ways to remove it?
5. Give an example of food from the protein and carbohydrate classes.
6. What is the importance of fats to our body?
7. Tick (✓) the food that provides vitamins.

Cereals Anchovies

Papaya Tomatoes

8. *Nasi lemak* is an example of a Malaysian breakfast meal.

(i) Is it healthy?



Yes



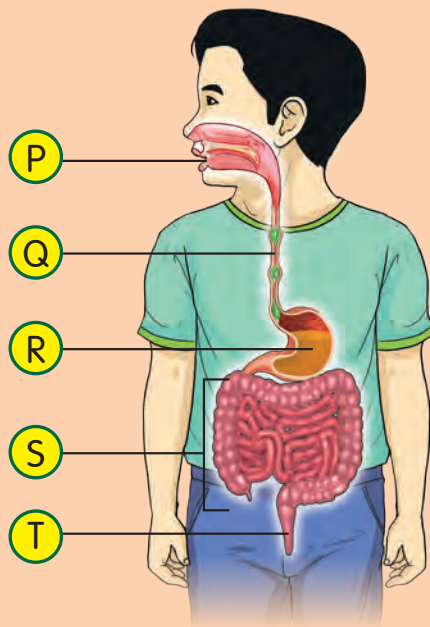
No

(ii) Give your reasons.

9. What is the importance of a balanced diet to our bodies?

10. What is the meaning of the digestion process?

11. What are the parts labelled P, Q, R, S, and T?



12. What will happen to digested food not needed by the body?

13. The following statements are all actions that disrupt the digestion process, except:

(i) eating while jumping.

(ii) eating in the park.

(iii) eating while laughing.

(iv) eating late at night.



HOTS

Based on the Malaysian Food Pyramid, why are the amounts of food consumption different at each level?

Unit 4

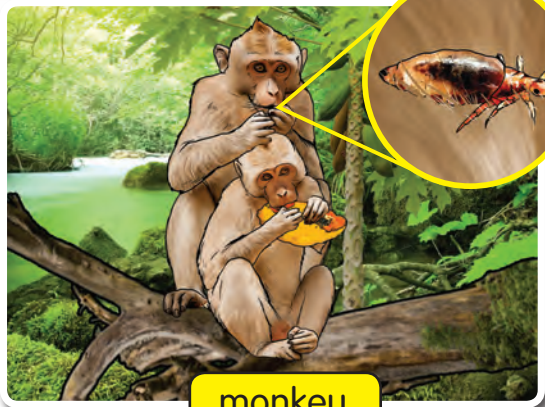
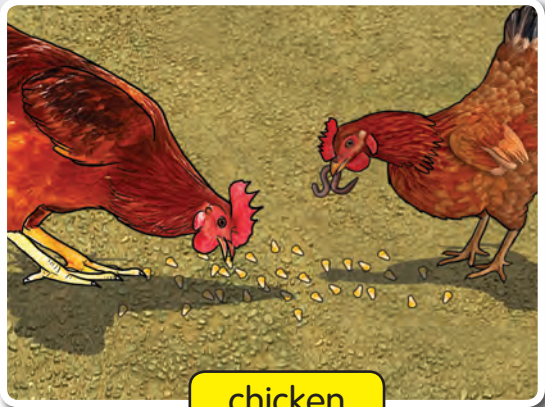
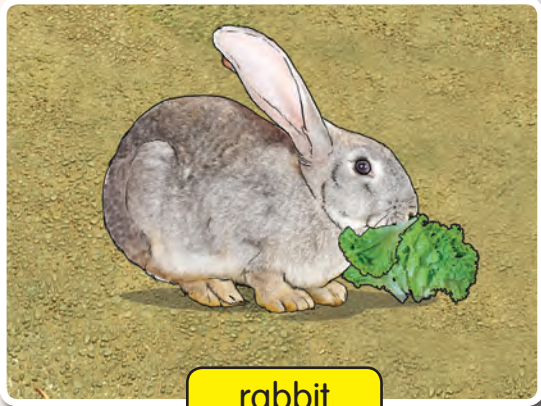
ANIMALS



What might be the food eaten by these animals?

Classification of Animals

Observe the pictures below.



What do these animals eat?

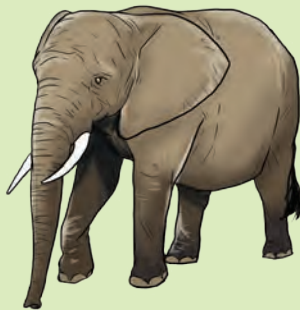


Teacher, how do we classify these animals?



We classify these animals based on their eating habits.

Animals that eat plants only



Animals that eat other animals only



Animals that eat plants and other animals



Based on the classifications above, can you name other animals that have similar eating habits to the animals above?

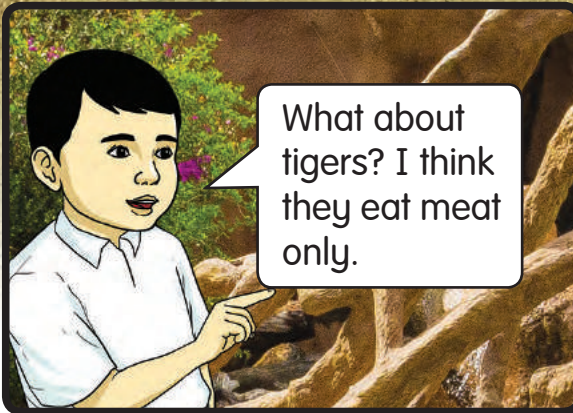
Activity Book
Page:

37

Animals' Eating Habits

Teacher, these rabbits eat carrots and mustard leaves.

Yes, rabbits are **herbivores** because they eat plants only.



Tigers are **carnivores** because they eat other animals only. Are there any animals that eat both?



Chickens are **omnivores** because they eat plants and other animals.



Give other examples of animals that are herbivores, carnivores, and omnivores. Why do you choose these animals?

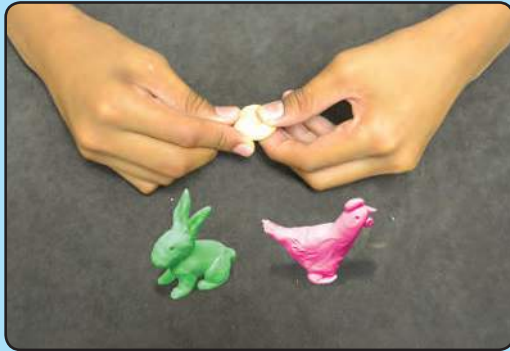
4.1.2
4.1.3



Apparatus and Materials

- clay
- white paper
- marker pens

Steps



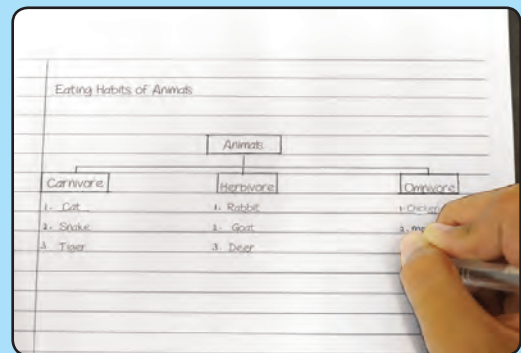
1. Make three animal models using clay according to their eating habits.



2. Display the animal models according to their eating habits on a piece of white paper.



3. Observe the animal models from other group. List the animals according to their eating habits.



4. Draw a tree map showing the classification of eating habits of the animals in your Science exercise book.

Question

Which animals have you classified as carnivores, herbivores, and omnivores?



TEACHER'S NOTES

- The choice of graphic organisers can be varied.
- Animal models can be replaced with animal pictures.

Activity Book
Pages:

38-41

Dentition of Animals

Do you know that animals have different types of teeth?

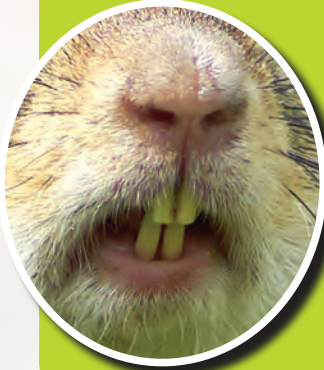
Carnivores

- Have sharper canines than other animals
- Have sharp canines to tear meat



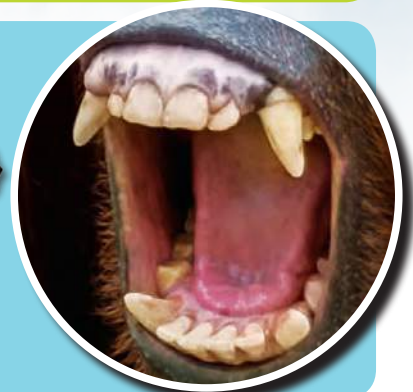
Herbivores

- Have strong incisors to cut plants
- Have big molars to grind plants for easier swallowing



Omnivores

- Have incisors to cut food
- Have canines to tear meat
- Have molars to grind food



Compare and contrast the teeth of carnivores, herbivores, and omnivores.



HOTS

Do all omnivores have the same types of teeth as mentioned above? Why?

If animals had teeth that did not suit their eating habits, what would happen to these animals?
Observe the situations below.

Herbivores



Why can't the goat above cut the grass easily?



Carnivores



Why is it difficult for the lion above to tear the meat?



Omnivores



Why could the orangutans above eat the fish easily, but not the banana?



Why do herbivores, carnivores, and omnivores have different types of teeth according to their eating habits?



Activity Book
Pages:

42-43

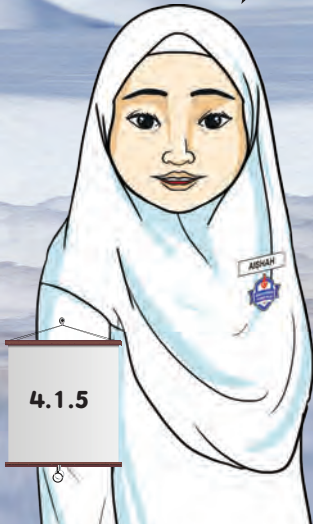
Changes in the Animals' Eating Habits

Bears are naturally omnivores that eat plants and other animals.



However, polar bears have changed their eating habits. Polar bears are classified as carnivores because they eat other animals only. They live in the polar regions, which are always cold and covered in ice. They cannot find plants because plants cannot grow in the polar regions. Therefore, polar bears eat other animals only.

What are other examples of animals that have changed their natural eating habits? Explain.



Activity Book
Page:

44



Fun Activity Who Am I?

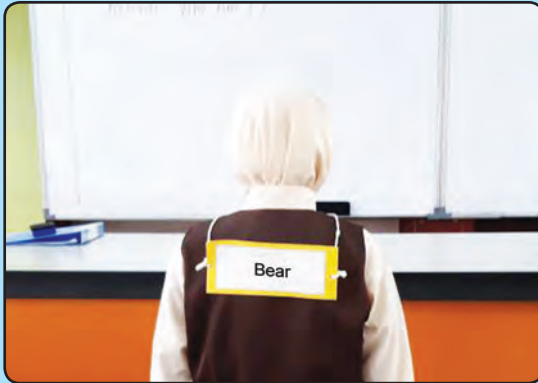


Apparatus and Materials

- animal flashcards
- string

Steps

1.



Form groups and select a member from each group. Hang an animal flashcard on his/her back without telling him/her the name of the animal on the card.

2.



The selected member asks questions to his/her group members about the animal's eating habit and teeth.

3. Other pupils may ask questions about the animal too.
4. Group members can only answer "Yes" or "No".
5. After the questioning session, the selected member must guess the name of the animal printed on his/her flashcard.

Question

Based on the activity above, describe the eating habit and the teeth of one of the animals that you have guessed correctly.

TEACHER'S NOTES

- The activity above is carried out using Who Am I? method of the 21st Century Learning Skills.

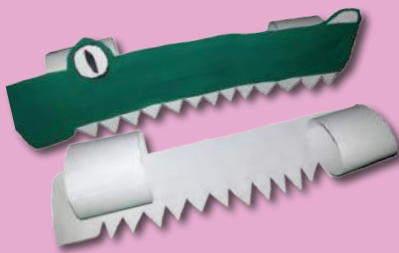
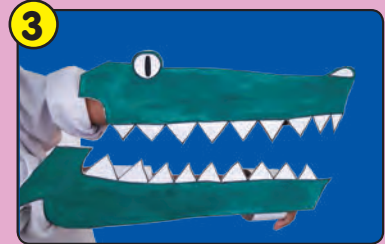
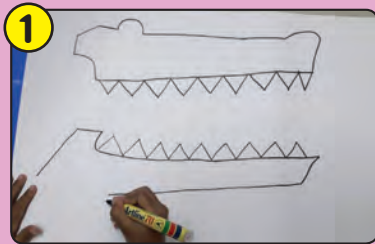
4.1.2
4.1.3
4.1.4



Leisure Science Animal Teeth Hand Puppet

Steps

Make an animal teeth hand puppet using a manila cardboard, water colours, a paint brush, adhesive tape, marker pens, and scissors. **Caution**



Let's Remember

1. Classification of animals according to their eating habits:

Classification	Eating Habit	Example of Animals
Herbivore	Eats plants only	Rabbit
Carnivore	Eats other animals only	Tiger
Omnivore	Eats plants and other animals	Chicken

2. Dentition of animals according to their classifications:



carnivore



herbivore



omnivore

3. Animals may change their natural eating habits if there are environmental changes around them.

Let's Answer

Answer all the questions in the Science exercise book.

1. What is the eating habit of each animal mentioned below? Explain.

(i)



bat

(ii)



frog

(iii)



cow

2. State two other animals that have the same eating habits as the animals below.

(i)



grasshopper

(ii)



shark

(iii)



pigeon

3. Underline the correct answers.

(i) Carnivores are animals that eat (other animals/plants) only.

(ii) Herbivores are animals that eat (other animals/plants) only.

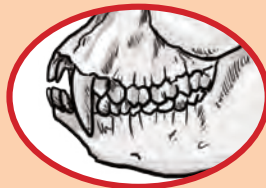
(iii) Omnivores are animals that eat (other animals/plants).

4. Name two animals that have the following dentition.

(i)



(ii)



(iii)



5. Explain the function of incisors and molars in herbivores.



HOTS

If there were shortage of natural food resources, what would happen to the animals' eating habits? Explain.

MANGROVE REPLANTING PROGRAMME

Wow! So many young plants.

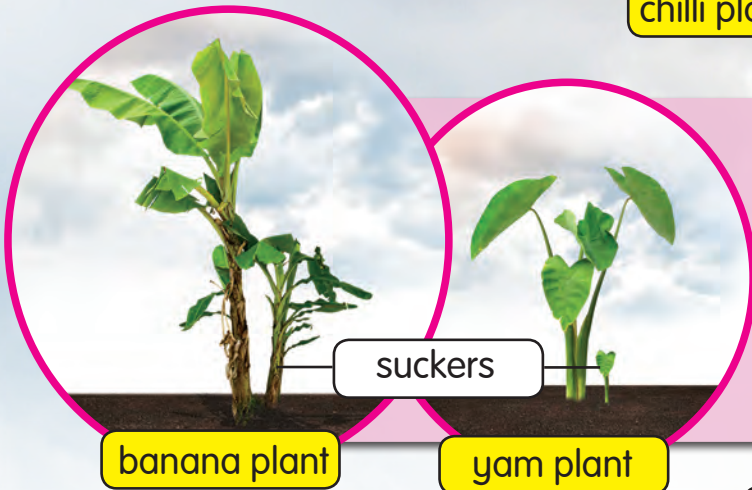
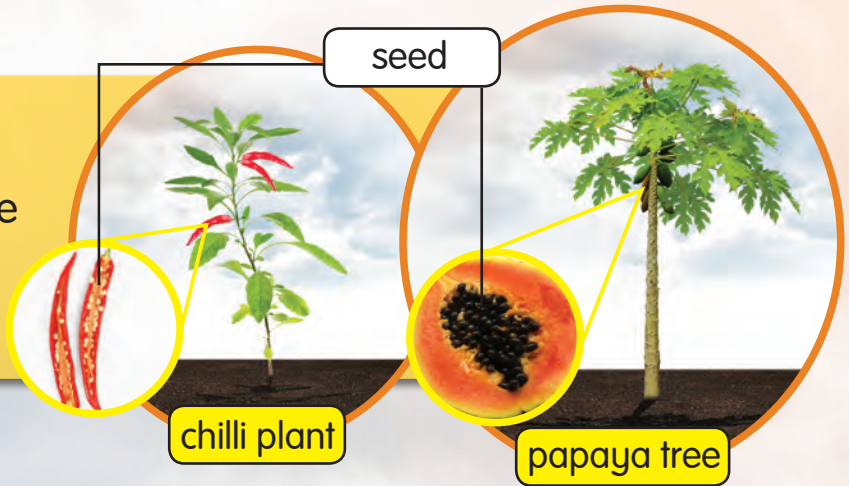
Why do they need to replant the young plants?

Ways of Reproduction in Plants

Plants need to reproduce to avoid extinction.
Plants can reproduce in various ways.

Seeds

Plants that produce fruits reproduce through **seeds**.

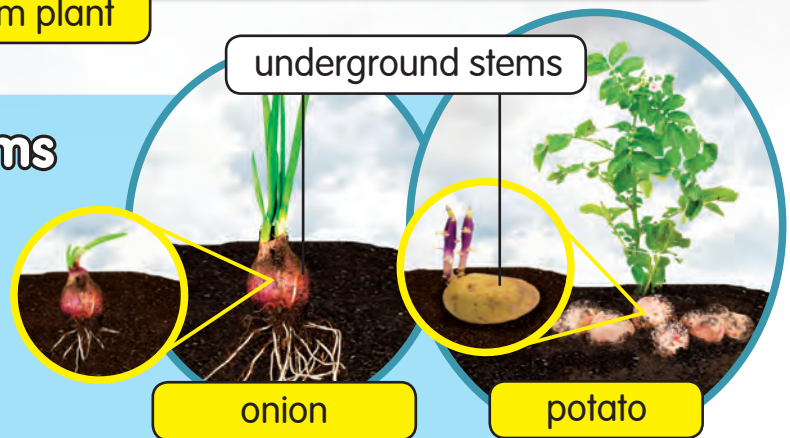


Suckers

Suckers are young plants that grow near their parent plants. They can grow into new plants.

Underground stems

Underground stems are the parts of plants that will grow into new plants when planted.



TEACHER'S NOTES

5.1.1

- Examples of underground stems are rhizomes, corns, tubers, and bulbs.



ferns



mushrooms

Spores

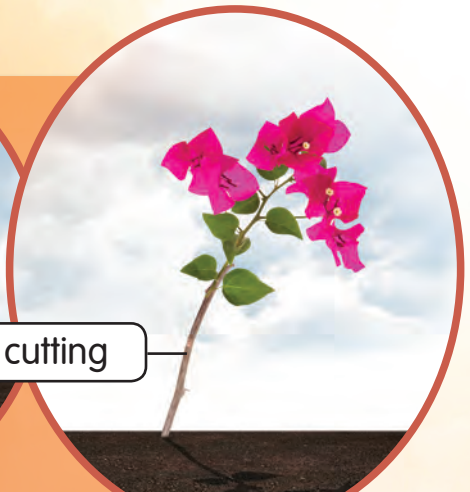
Non-flowering plants reproduce through **spores**.

Stem cutting

When a **stem cutting** of a plant is planted, it will grow into a new plant.



tapioca



bougainvillea



snake plant



setawar

Leaves

There are also plants that reproduce through their parents' **leaves**.

Give other examples of plants that reproduce in the ways stated above.

Importance of Plant Reproduction

Plants always reproduce to increase their numbers and maintain their species. Why?

Observe the situations below.

Situation 1



Situation 2



TEACHER'S NOTES

5.1.2

- A species is a group of living things that are of the same type and have the same characteristics.

Situation 3



Situation 4



Why is reproduction of plants important to life?



Reproduction in plants is important to life because it helps in conserving and maintaining our food source, habitat, oxygen supply, and wood supply.

Activity Book
Pages:

47-48

Single Plant, Different Ways of Reproduction



Let's Test Ways of Water Spinach Reproduction



Apparatus and Materials



- water spinach seeds



- water spinach stem cutting with the roots



- plastic container



- soil



- water

Steps

Stem Cutting

1. Put the stem cuttings with the roots in a plastic container with water.
2. Make observations of the growth of shoots every day.
3. Record your observations as in Table A.



Seeds

1. Plant water spinach seeds in a plastic container with soil.
2. Water the seeds every day.
3. Make observations of the growth of shoots every day.
4. Record your observations as in Table A.



Table A

Ways of Reproduction	Shoot Growth	
	Yes	No
Stem cutting		
Seeds		

Question

Is the water spinach able to reproduce in more than one way? Explain.

TEACHER'S NOTES

- Basil can be used instead of water spinach for this activity.
- Sweet potatoes also have two ways of reproduction, by stem cutting and underground stems.

Activity Book
Pages:

50-51

5.1.3

Technology in Plant Reproduction

Do you know that we can also reproduce plants using technology such as tissue cultures and marcottage?

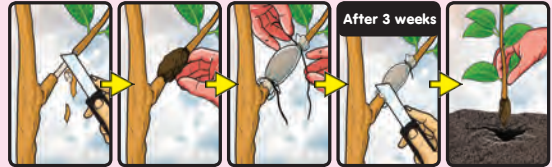
Tissue Cultures

Tissue cultures can produce new plants from tissues of a parent plant that are placed in a nutrient medium. Examples are banana plants and orchid plants.



Marcottage

Marcottage can increase the number of plants without planting seeds. Examples are mango trees and lime trees.



Identify examples of other plants that can be reproduced using technology such as tissue cultures and marcottage.



Leisure Science

Hanging Garden

Steps

Create a hanging garden using your creativity with used objects such as plastic bottles.



Activity Book
Page:

49



Let's Remember

- Plants reproduce through various ways such as:
 - seeds
 - stem cuttings
 - leaves
 - underground stems
 - suckers
 - spores
- Plant reproduction is important to ensure that plants are always there to provide:
 - food sources to other living things
 - habitats as shelter to other living things
 - oxygen supply to living things
 - wood supply
- There are certain plants that have two ways of reproduction such as water spinach, basil, and sweet potato.
- The reproduction of plants can also be done using technology such as tissue cultures and marcottage.



Let's Answer

Answer all the questions in the Science exercise book.

- (a) Identify the ways of reproduction for the plants below:



(i) bougainvilleas



(ii) onions



(iii) mushrooms

- (b) State other examples of plants with the same ways of reproduction as above.
- What is the importance of plant reproduction?
- State two examples of plants that are able to reproduce in two different ways.
- Give two examples of plants that can be reproduced using tissue cultures.

Unit 6

MEASUREMENT

During the last school holidays, Langgi and his sister helped their father to work on his ornamental fish enclosures.

Father, why are these enclosures different in size?

This large enclosure can be filled with more fish.

Oh! No wonder this small enclosure has lesser fish.

How is the size of the enclosure measured?

Area



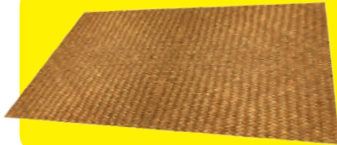
Wow! This football field is bigger than my school's football field, father.

The size of a place or surface is called **area**.

Area is measured using a measuring tool and is expressed in a suitable unit. Let us look at the objects below and their units of measurement.



The area of a book can be expressed in **square centimetre** or written as cm^2 .



The area of a mat can be expressed in **square metre** or written as m^2 .



The area of Sabah can be expressed in **square kilometre** or written as km^2 .

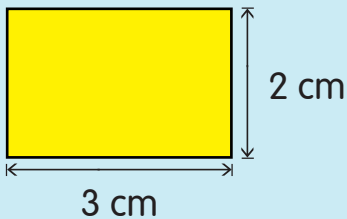
What is the suitable unit for the area of these objects?



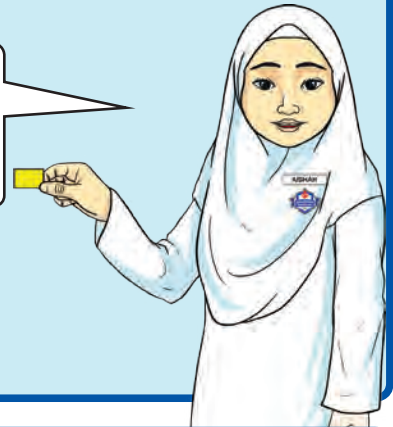
6.1.1

Measuring the Area of Regular Surfaces

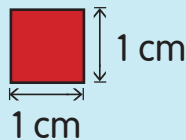
The area of a regular surface of an object can be measured using a paper square or graph paper.



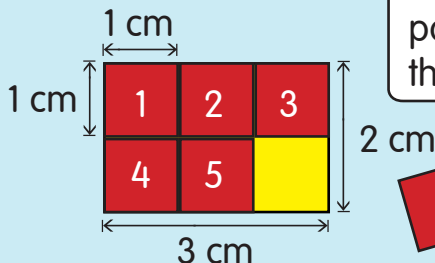
How do we measure the area of this card?



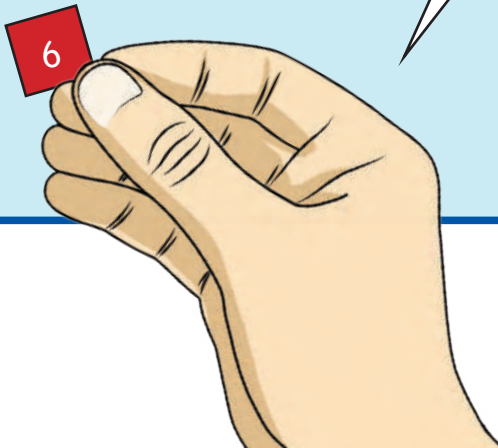
We can use 1 cm^2 -sized paper squares to measure it.



A paper square of $1\text{ cm} \times 1\text{ cm}$ is the same as 1 cm^2 .



The area of the surface is 6 cm^2 , as six 1 cm^2 paper squares are needed to fill the area of the card.



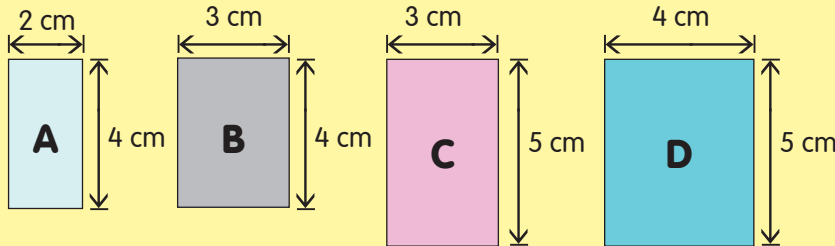
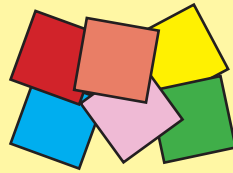


Let's Test Measuring the Area of Regular Surfaces



Apparatus and Materials

- glue
- 1 cm x 1 cm paper squares
- 1 set of cards (put into an envelope)



Steps

1. Each group picks a card from the envelope containing the set of cards. Arrange and paste the paper squares onto the selected card.
2. Count and record the area of the card pasted with paper squares as in Table A.

Table A

Group name	Selected card	Number of paper squares used	Area of card (cm ²)

3. Go to another group and compare your completed work.
4. Discuss the results of the areas of cards with the other groups in the class.

Questions

1. How do we find the area of a card using 1 cm x 1 cm paper squares?
2. Which card needs the most 1 cm x 1 cm paper squares? Why?

TEACHER'S NOTES

- The activity above is carried out using the Station method of the 21st Century Learning Skills.

Activity Book
Pages:

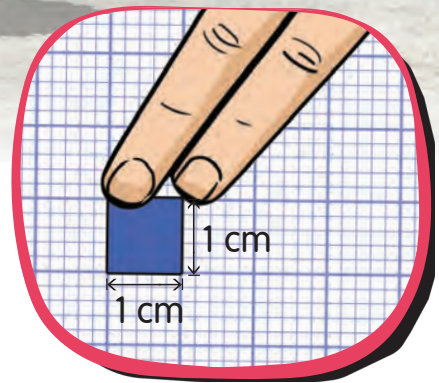
54-55

Estimating the Area of Irregular Surfaces

There are various objects around us that have irregular surface areas. State the objects that have irregular surfaces in the situation below.



We can estimate the area of an irregular surface by using 1 cm x 1 cm paper squares or graph paper.



Graph paper is filled with squares and lines. We can use the 1 cm x 1 cm squares on graph paper to estimate the area of an irregular surface.

Do you know that measurement is important in our daily lives because it can prevent wastage? Can you give an example?

6.1.3

Activity Book
Page:

56

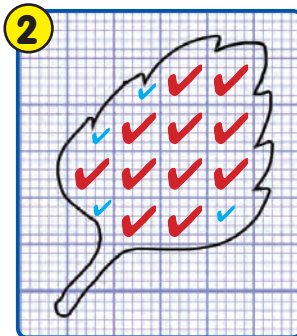
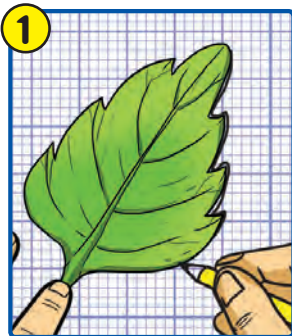
Langgi and Kina want to estimate the surface area of a leaf.



Kina, how do we estimate the surface area of this leaf?



We need to put the leaf on the graph paper, and then sketch the shape of the leaf.



Tick (✓) each full square, (✓) each half square, and more than half full square.

Count all the (✓) and (✓).

The estimated surface area of this leaf is 15 square centimetres.



Let's Test Estimating the Area of Irregular Surfaces



Apparatus and Materials

- graph paper
- heart, starfish, and butterfly-shaped cards

Steps

1. Sketch the heart-shaped card on the graph paper.
2. Tick (✓) the area that covers the graph paper.
3. Repeat steps 1 and 2 with the starfish and butterfly-shaped cards.
4. Count the number of (✓) and record them as in Table A.

Question

How do you solve the problem of estimating the area of an irregular surface?

Table A

Card shape	Estimated area of card (cm ²)
Heart	
Starfish	
Butterfly	

Volume

Which vehicle can take more pupils?



A bus can take more pupils because it is bigger. Therefore, the **volume** of the bus is greater than the van.

Volume is the amount of space which can be filled with solid, liquid or gas.

Volume is measured using measuring tools and is expressed in suitable units. Observe the objects below and their units.



200 ml

The volume of a carton of milk is expressed in **millilitre** or written as **ml**.



The volume of a bottle of water is expressed in **litre** or written as **l**.



The volume of a water tank is expressed in **cubic metre** or written as **m³**.

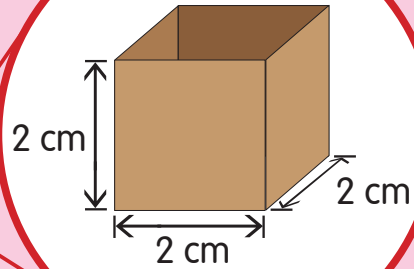
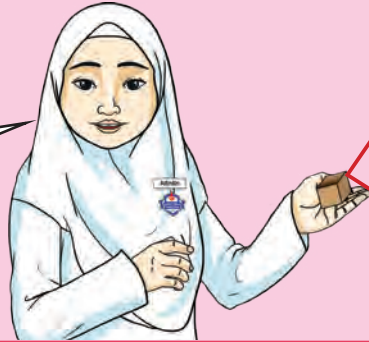
What is the unit of measurement for liquids in the objects shown?



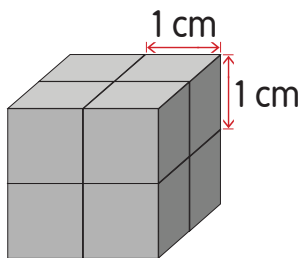
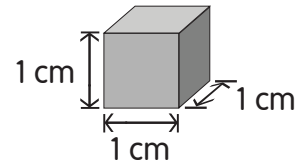
Measuring the Volume of Hollow Boxes

Can we measure the volume of hollow boxes? How?

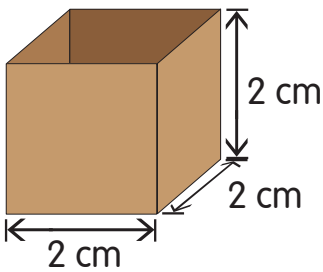
What is the volume of this hollow box?



We can measure the volume of hollow boxes using 1 cubic centimetre cubes.



The volume of the hollow box is equal to the number of 1 cubic centimetre cubes that fill the hollow space.



The box needs eight 1 cubic centimetre cubes to fill the hollow space. Thus, the volume of the hollow box is 8 cubic centimetres.





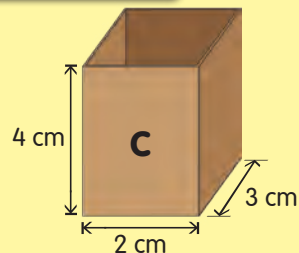
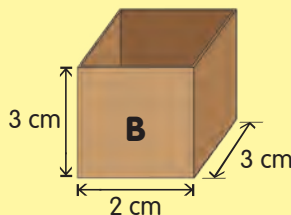
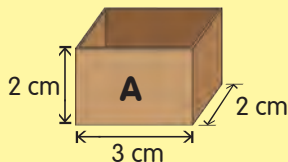
Let's Test

Measuring the Volume of Hollow Boxes

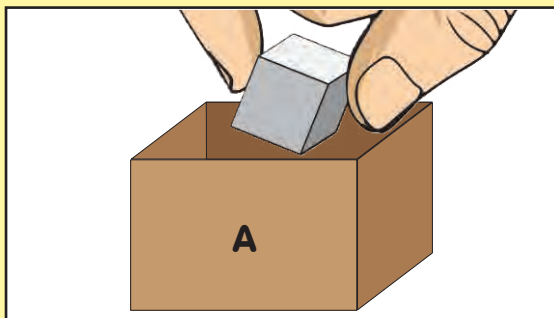


Apparatus and Materials

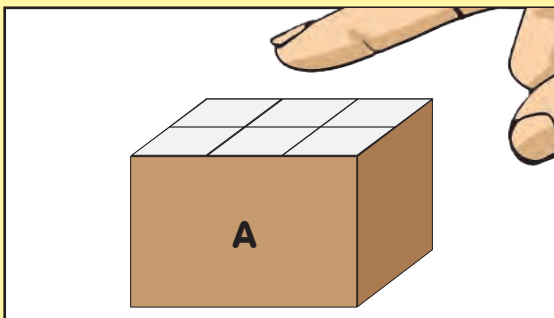
- 24 cubes of 1 cm^3 -sized cubes
- hollow boxes



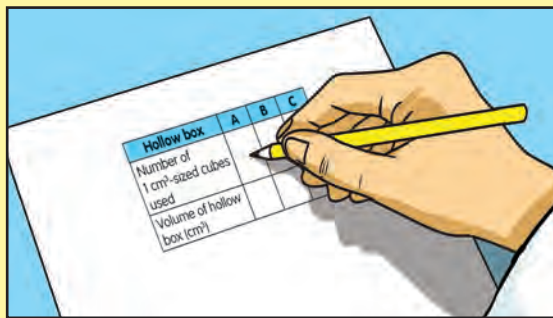
Steps



1. Fill the hollow box A with 1 cm^3 -sized cubes.



2. Count the number of 1 cm^3 -sized cubes that fill the box completely.



3. Record the results as in Table A.

Table A

Hollow box	A	B	C
Number of 1 cm^3 -sized cubes used			
Volume of hollow box (cm^3)			

4. Repeat steps 1 to 3 for hollow boxes B and C.

Questions

1. Which hollow box has the most number of 1 cm^3 -sized cubes?
2. If a total of 90 cubes of 1 cm^3 -sized cubes are required to fill a hollow box, what is the volume of the hollow box?
3. How do we measure the volume of a hollow box?

Measuring the Volume of Liquid

Lim, Langgi, and Aishah bought a carton of milk. They want to know whether the volume of the carton of milk is the same as the label on the carton.

The volume of the carton of milk is 200 millilitres.

Is the volume exactly 200 millilitres?

Let's measure it.

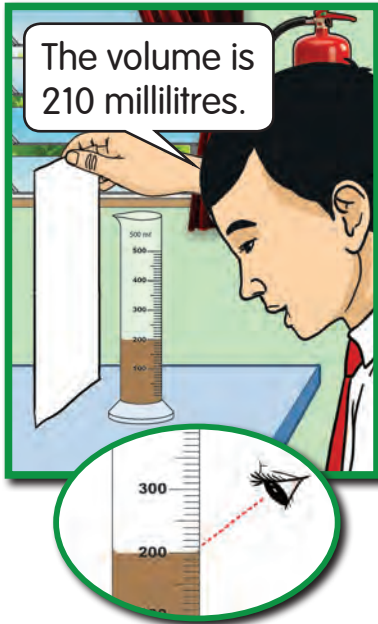


What are the suitable tools for measuring the volume of liquid?

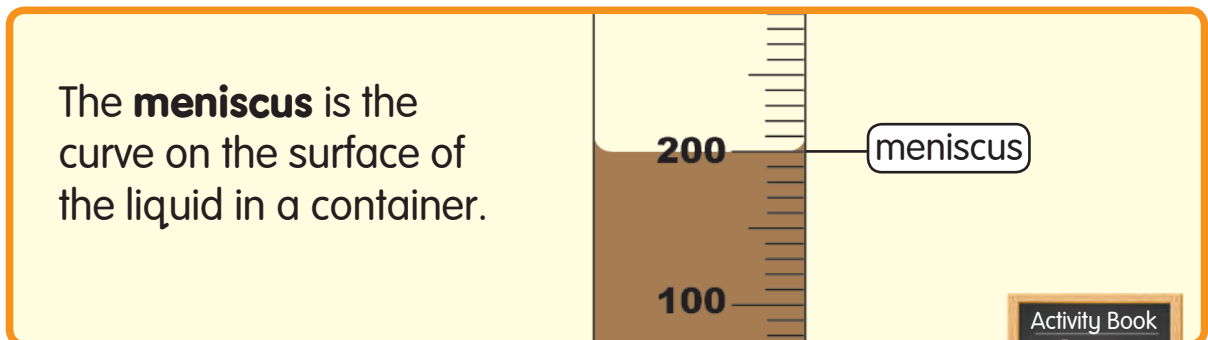
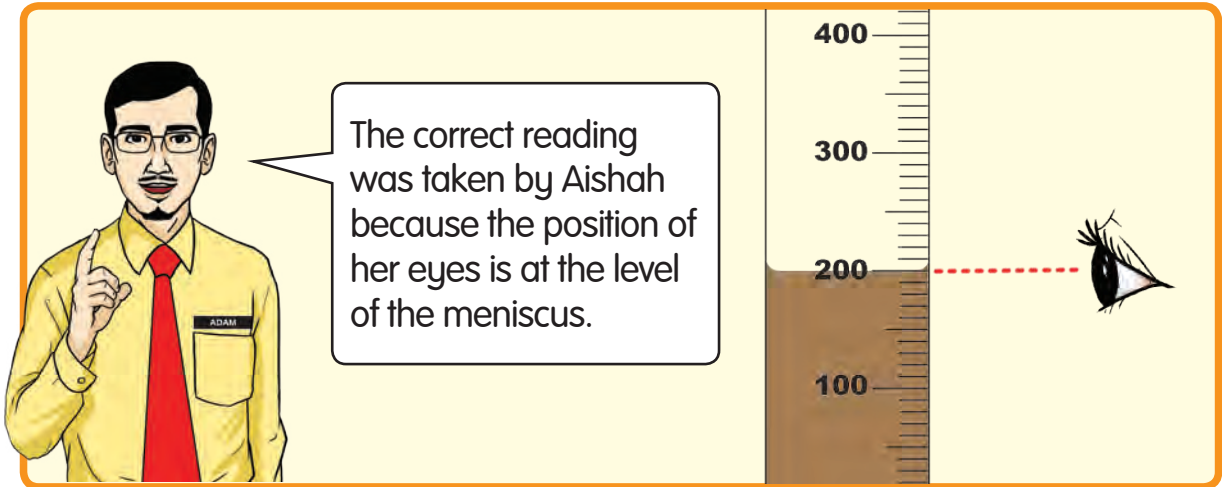
The volume of liquid can be measured using a measuring cylinder or a beaker.



Lim, Langgi, and Aishah measure the volume of the carton of milk.



Who has the correct volume reading? Why?



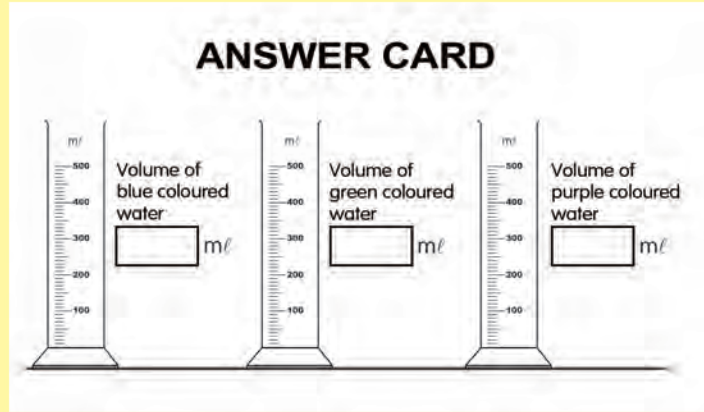


Let's Test Measuring the Volume of Coloured Water



Apparatus and Materials

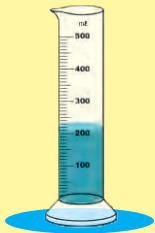
- measuring cylinder
- answer card
- blue coloured water
- green coloured water
- purple coloured water



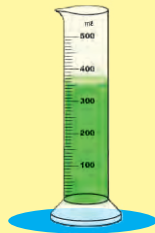
sample of answer card

Steps

1. Each group prepares the answer card as above.
2. Move to each station, record the volume of coloured water, and write it on the answer card.



Station 1
Measuring cylinder with blue coloured water.



Station 2
Measuring cylinder with green coloured water.



Station 3
Measuring cylinder with purple coloured water.

3. After completing the activity at all stations, discuss the answers based on the answer card.

Questions

Does the coloured water level marked on your answer card differ from other groups? Why?

TEACHER'S NOTES

- The activity above is carried out using the Station method of the 2¹ Century Learning Skills.
- Answer card can be obtained by scanning the QR Code. Teachers are advised to print the card before the activity.

6.1.5
6.1.7

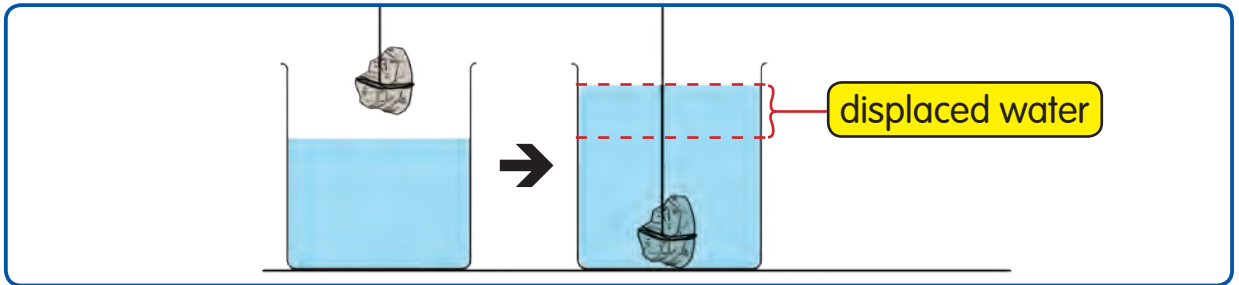
Activity Book
Pages:

59-60

The Volume of an Irregular Shaped Solid

How do we find out the volume of an irregular shaped solid?

The volume of an irregular shaped solid is determined by the **water displacement** method. The volume of the displaced water equals to the volume of the object.

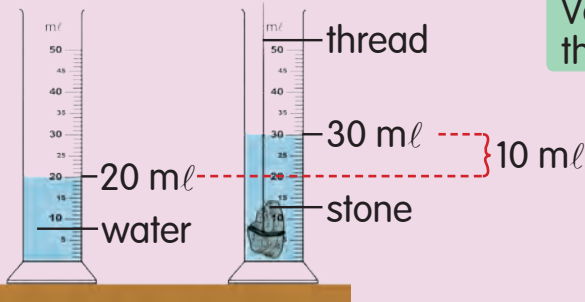


Water Displacement Methods

Method 1

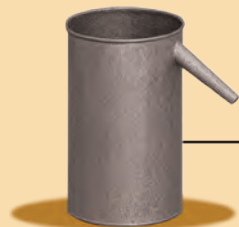
Initial volume

Final volume



$$\begin{aligned} \text{Volume of the stone} &= \text{Final volume} - \text{Initial volume} \\ &= 30 \text{ ml} - 20 \text{ ml} \\ &= 10 \text{ ml} \end{aligned}$$

Method 2

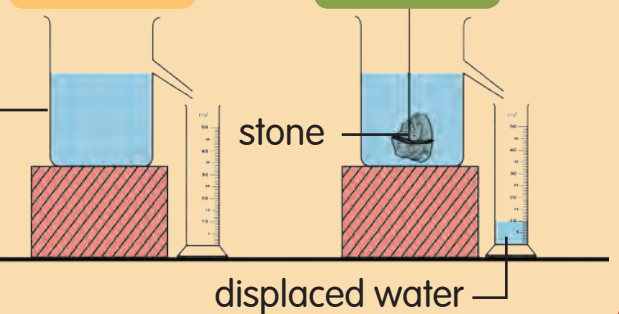


Eureka can

$$\text{Volume of displaced water} = \text{Volume of stone}$$

Before

After





Let's Test

Determining the Volume of Irregular Shaped Solids



Apparatus and Materials

- measuring cylinder
- thread
- water



- key



- padlock

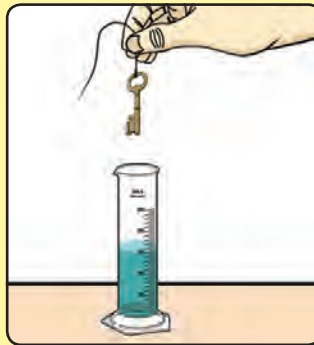


- rubber

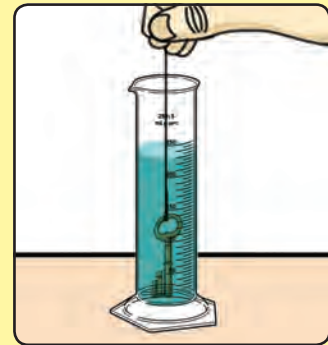
Steps



1. Fill the measuring cylinder with 30 ml of water. Record the initial volume as in Table A.



2. Tie the key with the thread and immerse it in the water in the measuring cylinder.



3. Observe the difference in the water level of the measuring cylinder. Record the final volume as in Table A.

Table A

Object	Initial Volume (ml)	Final Volume (ml)	Volume of Object (cm ³)
Key			
Padlock			
Rubber			

4. Repeat steps 1 to 3 with the padlock and the rubber.

Question

What is the method used to determine the volume of irregular shaped solids?

TEACHER'S NOTES

- This activity should be carried out on a flat surface.
- Besides the objects shown above, teachers may also replace them with other suitable objects.

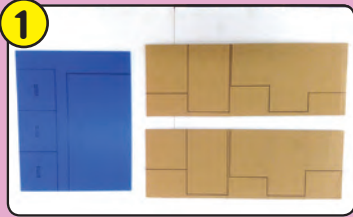
Activity Book
Pages:

61-62



Steps

Create coin boxes of various sizes with used materials. Use your knowledge in measurement that you have learnt to create the coin boxes.



Let's Remember

- The measuring units for area and volume are:

Area	
Unit	Symbol
square centimetre	cm ²
square metre	m ²
square kilometre	km ²

Volume	
Unit	Symbol
millilitre	ml
litre	l
cubic centimetre	cm ³
cubic metre	m ³

- There are two types of surface areas:
 - regular surface
 - irregular surface
- Area is measured using:
 - 1 cm x 1 cm paper squares
 - graph paper
- The volume of a hollow box is measured using 1 cm x 1 cm x 1 cm-sized cubes.
- The volume of an irregular shaped solid is measured by the water displacement method.
- The volume of liquid is read with the position of the eyes at the level of the meniscus.
- Measurement is important in daily life to calculate areas and volumes accurately to avoid wastage.



? Let's Answer

Answer all the questions in the Science exercise book.

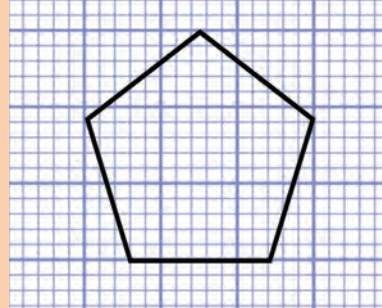
1. Write the following area and volume in words.

(i) 2 cm^2

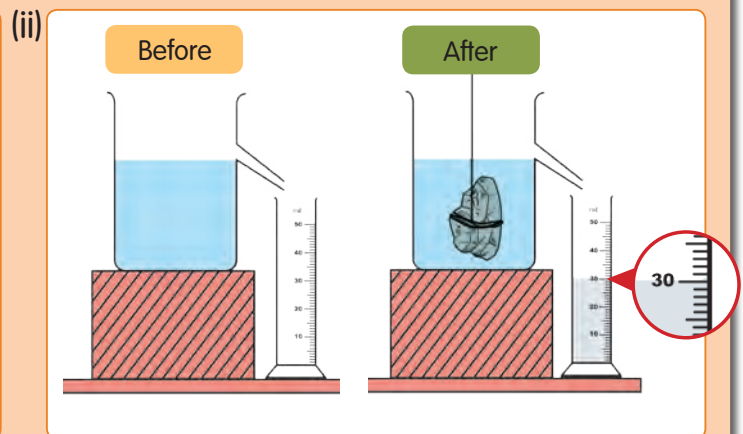
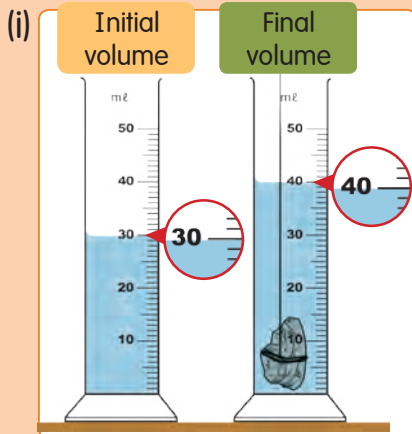
(ii) 10 cm^3

2. Surface area can be measured using  paper and $1 \text{ cm} \times 1 \text{ cm}$ paper .

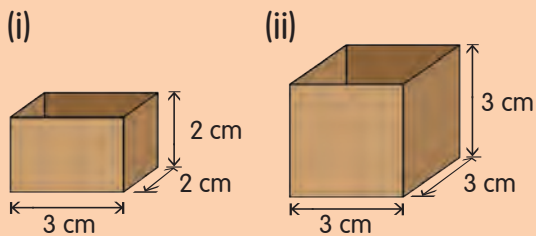
3. Estimate the surface area of the object below.



4. Calculate the volume of the object below.



5. Calculate the volume of the hollow boxes.



6. Lim's father wants to install tiles on the floor of his house. What will happen if Lim's father does not measure the floor of his house?

HOTS

How do we measure the volume of a nail using the apparatus below?



full glass of water

basin



syringe

nail

thread

Unit 7

DENSITY



Father, my toy duck floats!

Why doesn't the toy duck sink?

Float and Sink

There are objects or materials around us that float on the surface of water and those that sink.

What are the objects that float and what are the objects that sink?

The stone **sinks!**

Let's throw a stone into the water.

This branch **floats.**

7.1.1



Let's Test

Testing Objects that Float and Objects that Sink



Apparatus and Materials

- small aquarium
- coin
- ping-pong ball
- marble
- soap
- cork
- sponge

Steps

1. Fill the aquarium with water.
2. Put all objects to be tested in the aquarium.
3. Observe whether each object floats or sinks.
4. Record your observations as in Table A.

Table A

Object	Sink	Float
Coin		
Ping-pong ball		
Marble		
Soap		
Cork		
Sponge		

Questions

Based on the activity above:

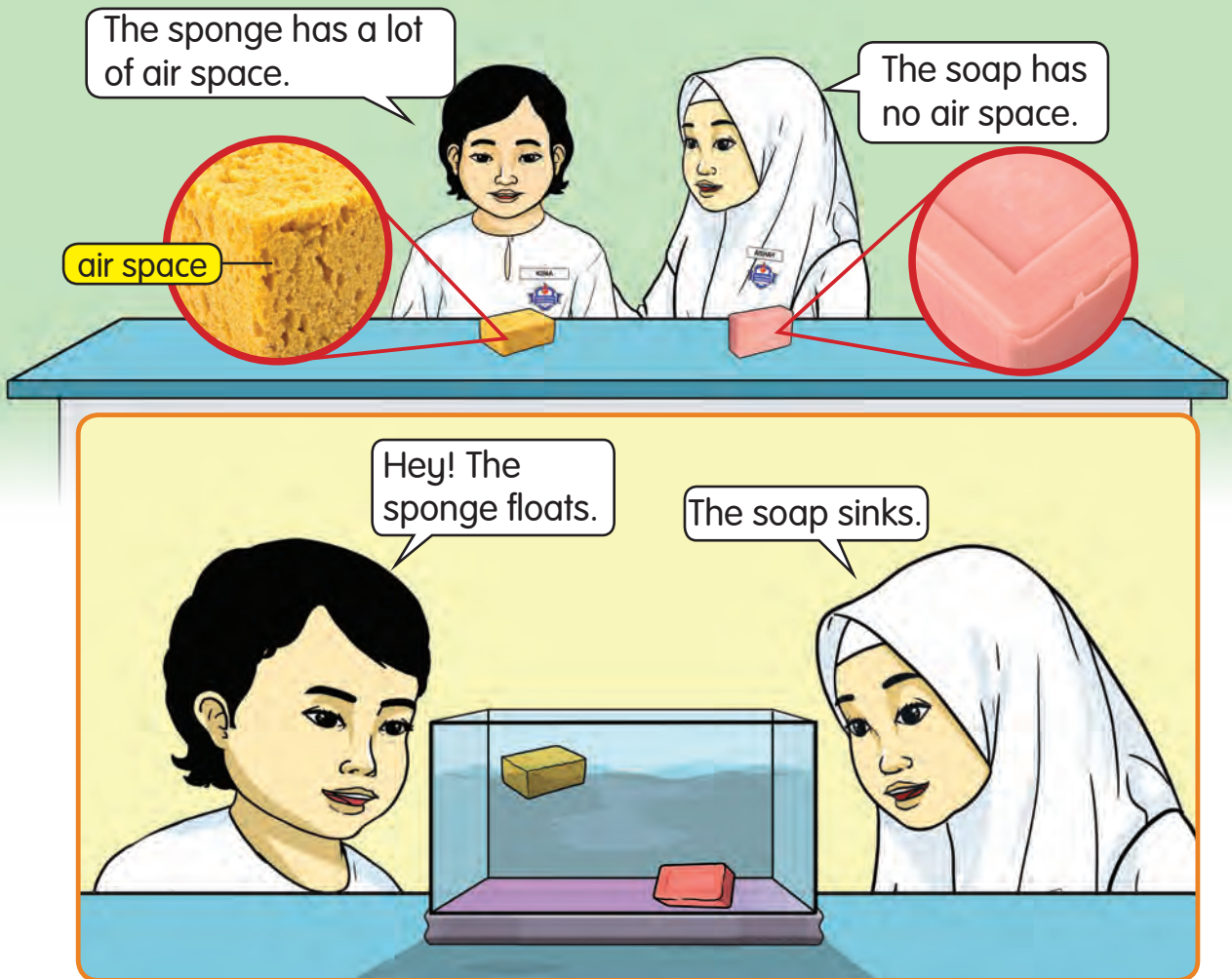
- (i) Which objects float? (ii) Which objects sink?



Why do objects float or sink?

Density

The floating or sinking of an object is related to the density of the object against the density of water. Observe the situation below.



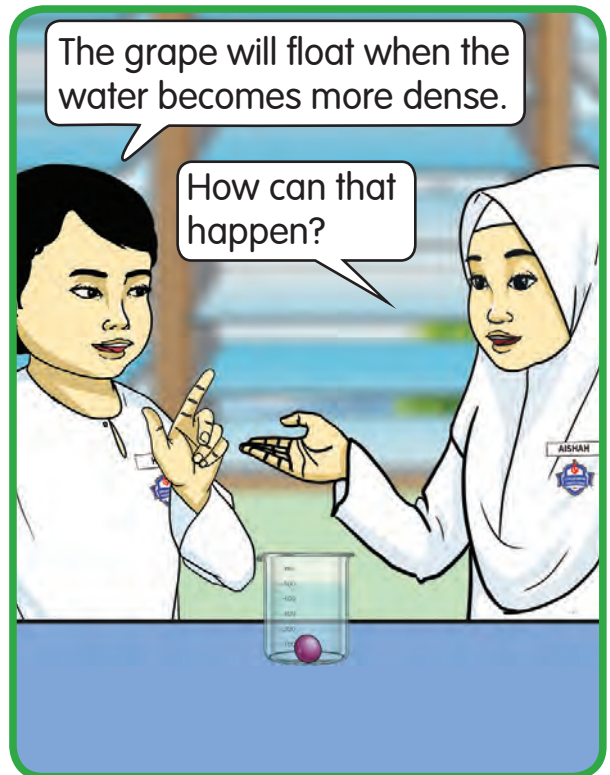
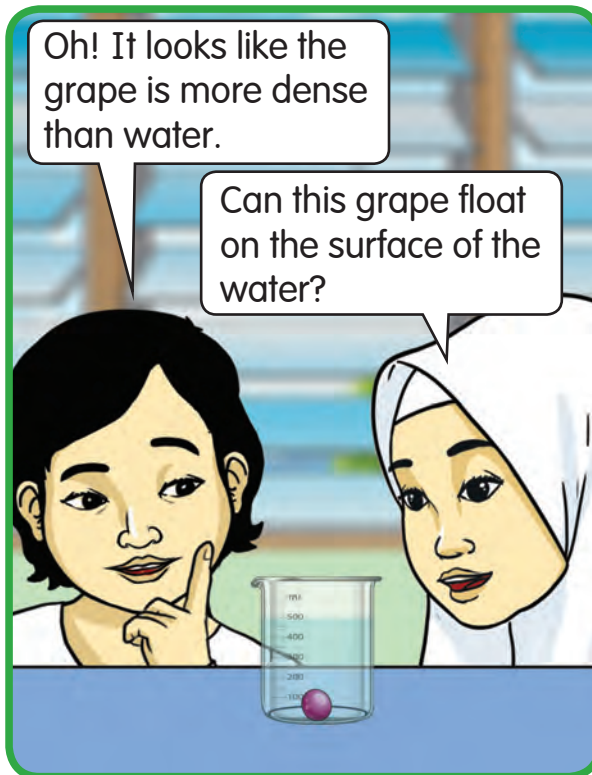
The density of objects is different from one to another. There are objects that are more dense than water and objects that are less dense than water.

Objects that are **less dense** than water will **float**.
Objects that are **more dense** than water will **sink**.

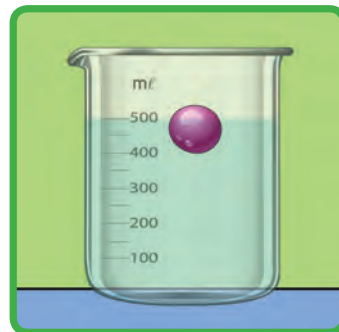
Why do logs float on the surface of water but rubber bands sink in water?



Water Becomes More Dense



When salt is dissolved in water, the water will become more dense. Therefore, the grape that sank before, can now float.



Water becomes more dense when salt is added to it.

What will happen if sugar is added to water?
Let us carry out an experiment.




Let's Test Floating a Fish Model on Water





Apparatus and Materials


- beaker
- cutter **Caution**
- 200 ml of water
- sugar
- spatula
- carrot

Steps

- 

Carve out the shape of a fish from the carrot.
- 

Place the fish model and one spoonful of sugar in the water.
- 

Stir to dissolve all the sugar.
- 

Add more sugar and stir until the fish model floats.
5. Discuss your observation.

7.1.3
7.1.4

Activity Book
Page:

68

Questions

1. How many spoonfuls of sugar are needed to make the fish model float?
2. Why does the fish model float when sugar is added to the water?



Fun Activity

Density of Liquids



Apparatus and Materials

- plastic bottle
- beaker
- funnel
- 100 ml of coloured water
- 100 ml of cooking oil
- 100 ml of glycerine

Steps

1. Pour the coloured water into the bottle using the funnel. Then, pour in the cooking oil.
2. Screw on the bottle cap tightly and shake it. Leave it for a while. Observe the changes that take place.
3. Pour the glycerine slowly into the bottle and observe the changes.
4. Record your observations. Then, discuss.



Question

Compare the density of coloured water, cooking oil, and glycerine. Which is the most dense?

TEACHER'S NOTES

- Glycerine is available at a pharmacy or baking supplies store.

Applications of Density in Life

What are the applications of density in life?



Ships and anchors are made of iron. A ship floats on the surface of the water but an anchor sinks. Why?

Safety



Life jacket

Farming



Fish farming enclosures

How is density applied in the above situations?



Fun Activity Submarine Project



Apparatus and Materials

- plastic bottle
- weight
- basin
- clay
- adhesive tape
- 40 cm tube



Steps



1. Make a hole in the bottle cap and insert the tube into the opening.



2. Make several holes along one side of the bottle.



3. Attach the weight to the bottom of the bottle using adhesive tape.



4.

Screw on the bottle cap with the inserted tube. Seal the opening in the bottle cap with clay.

5. Fill the basin with water and submerge the submarine model in the water.

6. Blow air into the submarine model through the tube.

7. Observe the situation. Then, discuss.

Question

State two importance of density in life.



Leisure Science Dancing Egg Shells

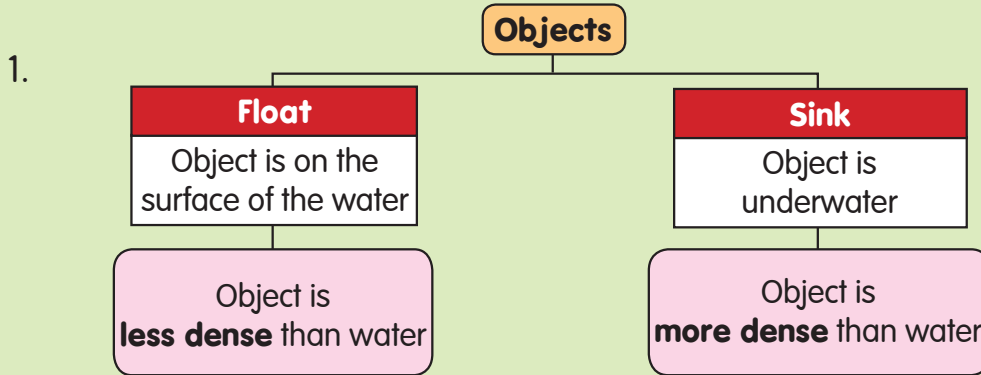
Steps

1. Put vinegar and crushed egg shells into a bottle and immediately screw on the bottle cap tightly.
2. Shake the bottle and observe the changes that take place.





Let's Remember



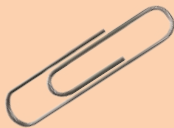
- The density of each object and liquid is different.
- Water can be made more dense by adding salt or sugar to it.
- Density applications in daily life are life jackets, iron anchors, and buoy at fish farming enclosures.



Let's Answer

Answer all the questions in the Science exercise book.

- Which of the following will float on water?



paper clip






apple



quill



grape

- An object that is  dense than water will sink.
- Oil will  on the surface of the water as oil is  dense than the water.
- How does a life jacket save a life?



HOTS

How can we sink an orange in water?



Unit 8

ACID AND ALKALI

Why do their facial expressions change after tasting lemon and coffee without sugar?



Acidic, Alkaline, and Neutral

There are substances around us that have acidic, alkaline, and neutral properties. The properties of these substances can be tested using litmus paper. Litmus paper is an indicator that changes colour when tested.

Litmus paper has two colours, which are blue and red.



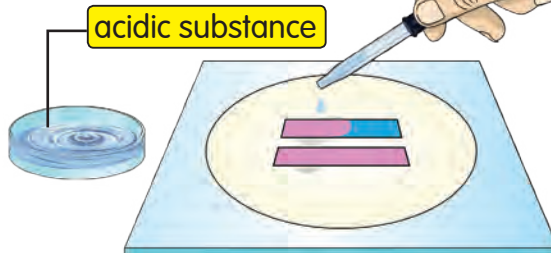
red litmus paper



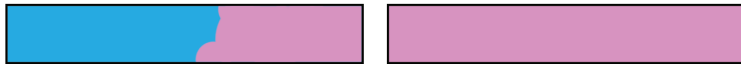
blue litmus paper

Change in Colour of Litmus Paper with an Acidic Substance

When an **acidic** substance is tested, only blue litmus paper **changes colour to red**.



Observation:



Blue → Red

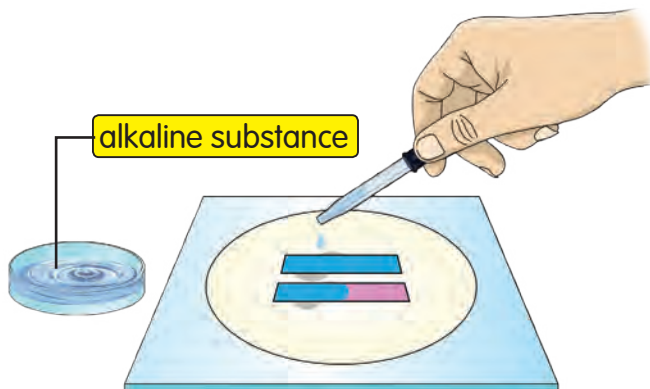
No change



HOTS

Can litmus paper be dipped directly into the substance to be tested? Explain.

Change in Colour of Litmus Paper with an Alkaline Substance



When an **alkaline** substance is tested, only red litmus paper **changes colour to blue**.

Observation:



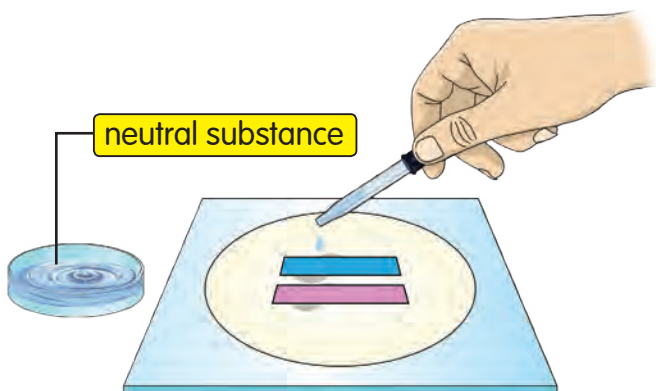
No change



Red → Blue



Change in Colour of Litmus Paper with a Neutral Substance



When a **neutral** substance is tested, there is **no change in colour** for both types of litmus paper.

Observation:



No change



No change



Which indicator is used to test substances for acidic, alkaline or neutral properties?

Activity Book
Pages:

69-71



Let's Test Testing a Substance Using Litmus Paper



Apparatus and Materials

- red and blue litmus papers
- filter paper
- dropper
- beaker
- petri dishes
- tile



• vinegar



• drinking water



• orange juice



• sugar solution



• slaked lime solution

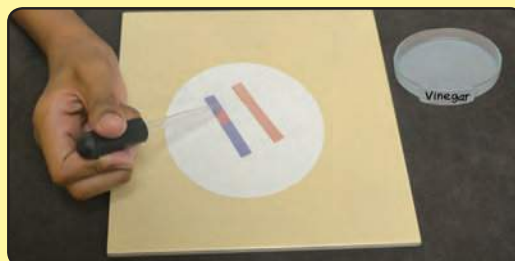


• sodium bicarbonate solution

Steps



1. Pour the vinegar into a labelled petri dish.
3. Observe the change in colour of the litmus papers and record the results as in Table A.



2. Test the vinegar with the red and blue litmus papers.

Table A

Substance	Change in colour of blue litmus paper	Change in colour of red litmus paper
Vinegar	Blue →	Red →
Drinking water	Blue →	Red →

4. Repeat steps 1 to 3 using other substances.

Question

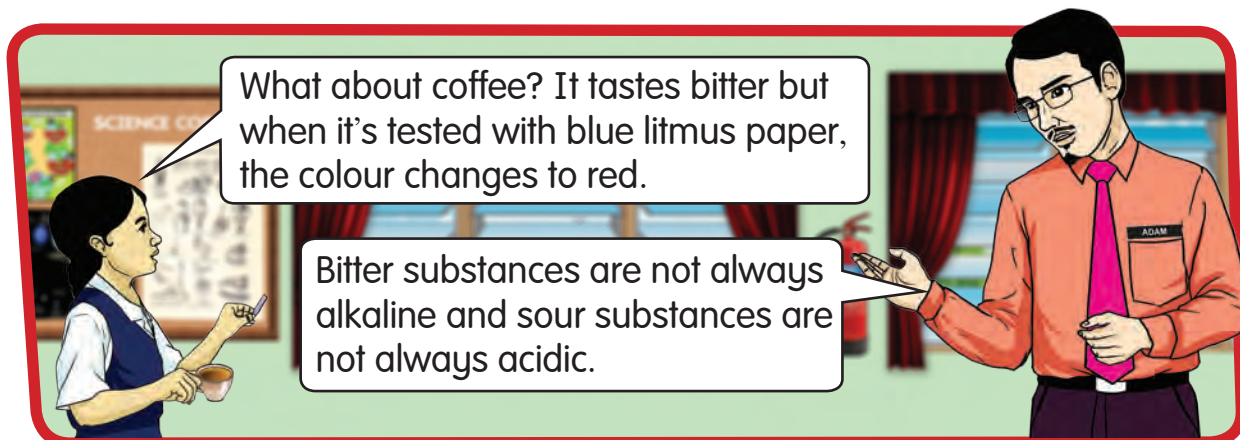
What is the property of a tested substance based on the change in colour of litmus paper?

Acidic, Alkaline, and Neutral Substances

Besides litmus paper, we can also test the properties of substances using our senses of taste and touch.



Most acidic substances taste sour and have a burning sensation when touched, while most alkaline substances taste bitter and feel slippery when touched. Neutral substances have different tastes such as tasteless, sweet, and salty. Neutral substances may feel slippery or coarse when touched.



Can the senses of taste and touch be used as indicators for acidic, alkaline, and neutral properties of substances? Why?



Let's Test Testing Acidic, Alkaline, and Neutral Properties



Apparatus and Materials

- red and blue litmus papers
- filter papers
- ice cream sticks
- dropper
- petri dishes
- tile



• fresh milk



• salt solution



• ketchup



• grapes



• egg white



• toothpaste

Steps

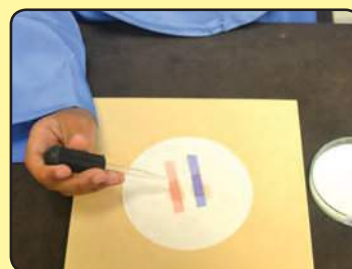
1. Put the substances to be tested into labelled petri dishes.



2. Taste the first substance with your tongue.



3. Touch the first substance with your finger.



4. Test the first substance with red and blue litmus papers.

5. Repeat steps 2 to 4 with the other substances.

6. Record the results as in Table A.

Table A

Substance	Taste	Touch	Change in litmus paper	Property of substance
Fresh milk			Blue →	
			Red →	
Salt solution			Blue →	
			Red →	

Question

What are the properties of acidic, alkaline, and neutral substances when tasted and touched?

TEACHER'S NOTES

- Teachers may use other suitable substances for the test. Examples are cooking oil, honey, tamarind, rice water, and others.

8.1.2
8.1.4

Acidic, Alkaline, and Neutral Substances Around Us

There are acidic, alkaline or neutral substances around us other than food. These substances are used in the fields of agriculture, medicine, health, and industry.



Fun Activity

Me-Share-Agree



Apparatus and Materials

Steps

Agriculture

Father, why do we need to sprinkle agricultural lime on the soil?

Agricultural lime is alkaline and reduces soil acidity.

Medicine



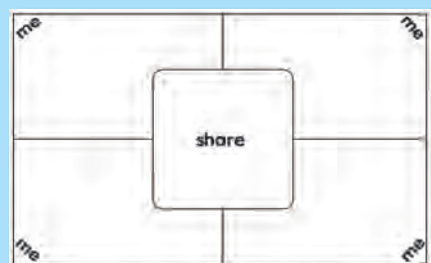
A wasp sting is alkaline. Vinegar may be applied to the area of the sting as first aid.

Household Products

Mother, how can I get rid of this slippery feeling from the bleach?

Rinse your hands with tamarind, then the slippery feeling will disappear.

- three situation cards



- example of Placemat Consensus

1. Form groups of four. Decide on a leader.
2. Each group prepares a Placemat Consensus.
3. The group leader chooses one situation card to be discussed with the other group members.
4. Each group member writes his/her ideas in the “me” space on the uses of acidic, alkaline, and neutral substances based on the situation card chosen.
5. After five minutes, discuss the ideas written down with other members in the group.
6. The results of the discussion are written in the “share” space.
7. Present the ideas for discussion in front of the class.

Question

What are other uses of acidic, alkaline, and neutral substances in our daily life? Discuss.



TEACHER'S NOTES

- The activity above is carried out using the Placement Consensus of the 21st Century Learning Skills.

Activity Book
Page:

76

Litmus Paper Substitutes

Besides litmus paper, we can also test acidic or alkaline properties of substances using other substances as indicators.



Let's Test Exploring Substitutes for Litmus Paper



Apparatus and Materials

- dropper
- petri dishes
- lime
- sodium bicarbonate



- turmeric extract



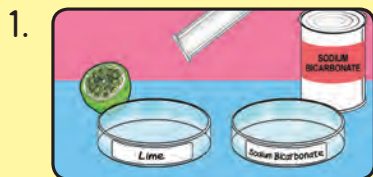
- purple cabbage extract



- hibiscus extract



Steps



1. Add 5 ml of lime extract to one petri dish and 5 ml of sodium bicarbonate solution to another.



2. Put a drop of turmeric extract in both petri dishes and observe the colour changes. Record your observation.

3. Repeat steps 1 and 2 using purple cabbage and hibiscus extracts.
4. Test all acidic and alkaline substances other than the lime extract and sodium bicarbonate solution.
5. Record the observations of any colour change. Discuss.

Questions

1. Which tested extract is only affected by alkaline?
2. Other than lime extract and sodium bicarbonate solution, what other test substances can be used?
3. Are turmeric, purple cabbage, and hibiscus extracts suitable to be used as indicators for the properties of acidic and alkaline substances?

TEACHER'S NOTES

- pH paper may be used as a substitute for litmus paper.
- The methods to prepare extracts of turmeric, purple cabbage, and hibiscus can be seen by scanning the QR Code.

Activity Book
Page:

75

8.1.3



Leisure Science An Acidic, Alkaline, and Neutral Tree

Steps

1. Create an acidic, alkaline, and neutral tree craft by decorating its branches and twigs using pictures of acidic, alkaline, and neutral substances.
2. Add an empty space at the bottom of the tree craft for your stationery.



Let's Remember

1. Acidic, alkaline or neutral properties can be tested using litmus paper.
2. Litmus paper has two colours which are blue and red.
3. The change in colour of litmus paper during testing is as follows:

Litmus paper colour	Acidic substances	Alkaline substances	Neutral substances
Blue	Changes to red	No change	No change
Red	No change	Changes to blue	No change

4. Examples of acidic, alkaline, and neutral substances:

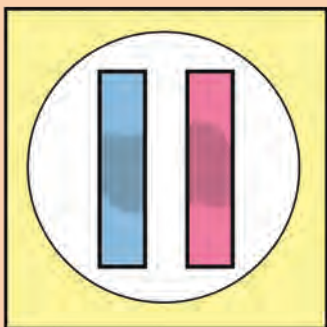
Acidic substances	Alkaline substances	Neutral substances
Lime	Soap	Salt solution
Tamarind	Slaked lime	Sugar solution

5. The acidic, alkaline, and neutral properties of a substance can also be tested using the senses of taste and touch, although these are not scientific indicators.
6. Acidic substances usually taste sour, while alkaline substances taste bitter and are slippery when touched. Whereas, neutral substances have many types of taste, such as tasteless, salty, and sweet.
7. Other substances that can be used to test acidic, alkaline or neutral substances are:
 - turmeric extract
 - hibiscus extract
 - purple cabbage extract
8. Acidic and alkaline substances are widely used in agriculture, medicine, and the manufacture of household products.

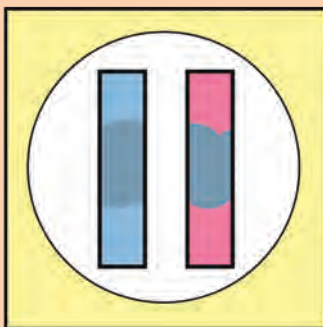
Let's Answer

Answer all the questions in the Science exercise book.

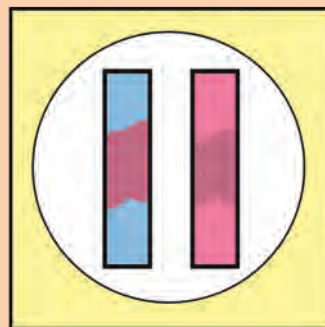
- What is the indicator used to test acidic, alkaline or neutral substances?
- (i) What are the properties of X, Y, and Z based on the change in the colour of litmus paper?



Properties of **X**



Properties of **Y**



Properties of **Z**



(ii) What are examples of X, Y, and Z?




- Besides litmus paper, acidic and alkaline substances may also be tested using extracts of , , and .
- Amar tested bitter gourd extract and recorded the results as in Table A.

Table A

Taste	Bitter
Touch	Slippery
Change in litmus paper	(i) Blue → red (ii) Red → no change

Based on the results above, can the senses of taste and touch be used as scientific indicators for the properties of bitter gourd? Why?

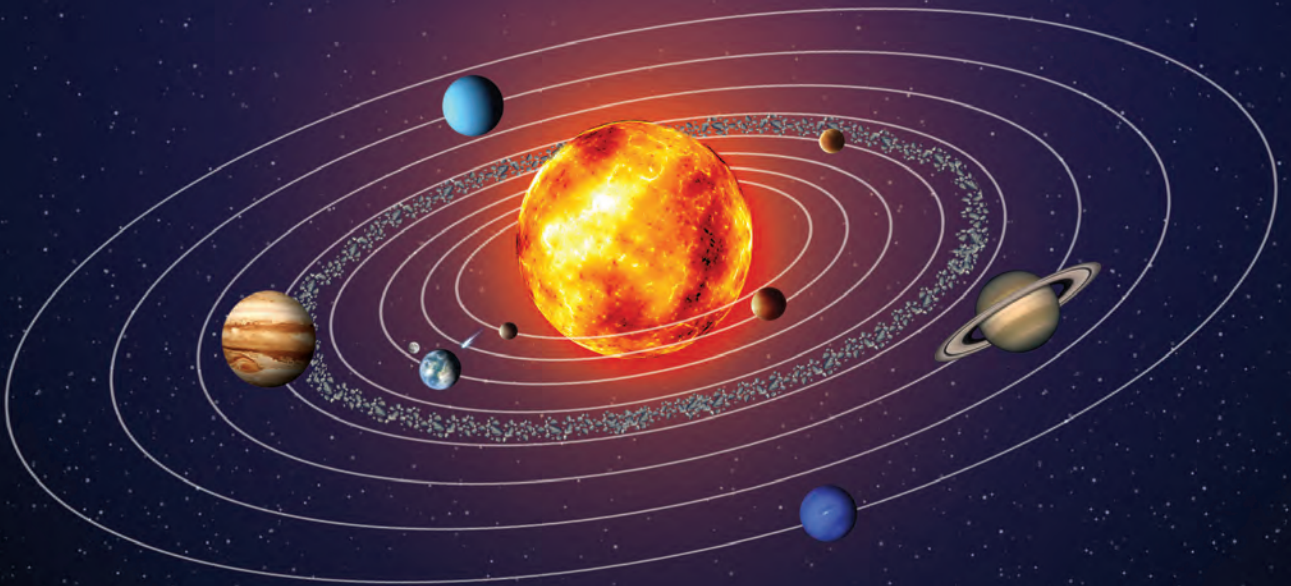
HOTS

Why does toothpaste have alkaline properties?

Unit 9

THE SOLAR SYSTEM

Langgi and his family are watching a presentation at the National Planetarium space theatre.



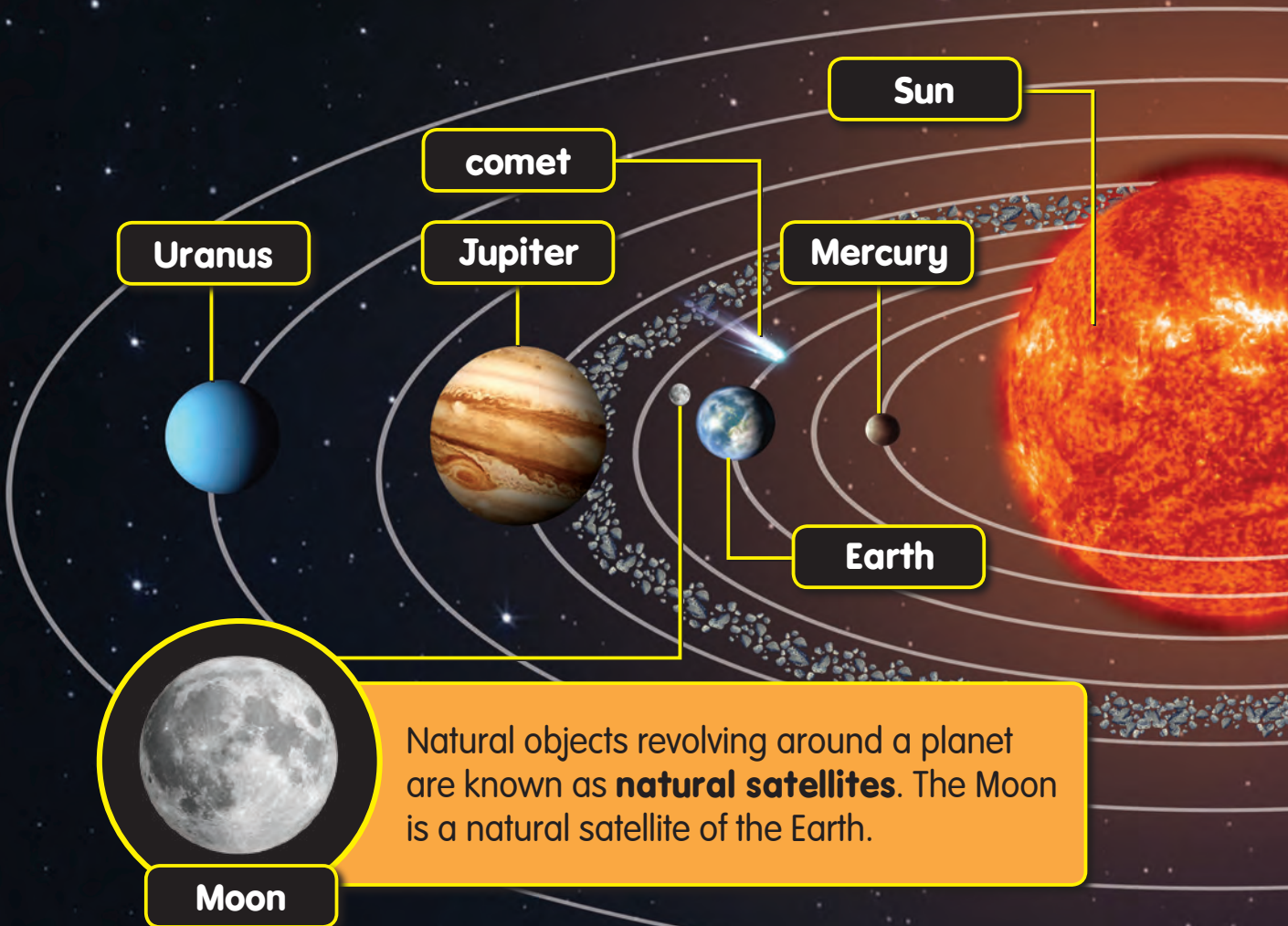
Wow! It's so beautiful.

What's that, father?

What is shown on the theatre screen?

Members of the Solar System

The Solar System is made up of the Sun, planets, natural satellites, asteroids, meteoroids, and comets. Let us get to know our Solar System.



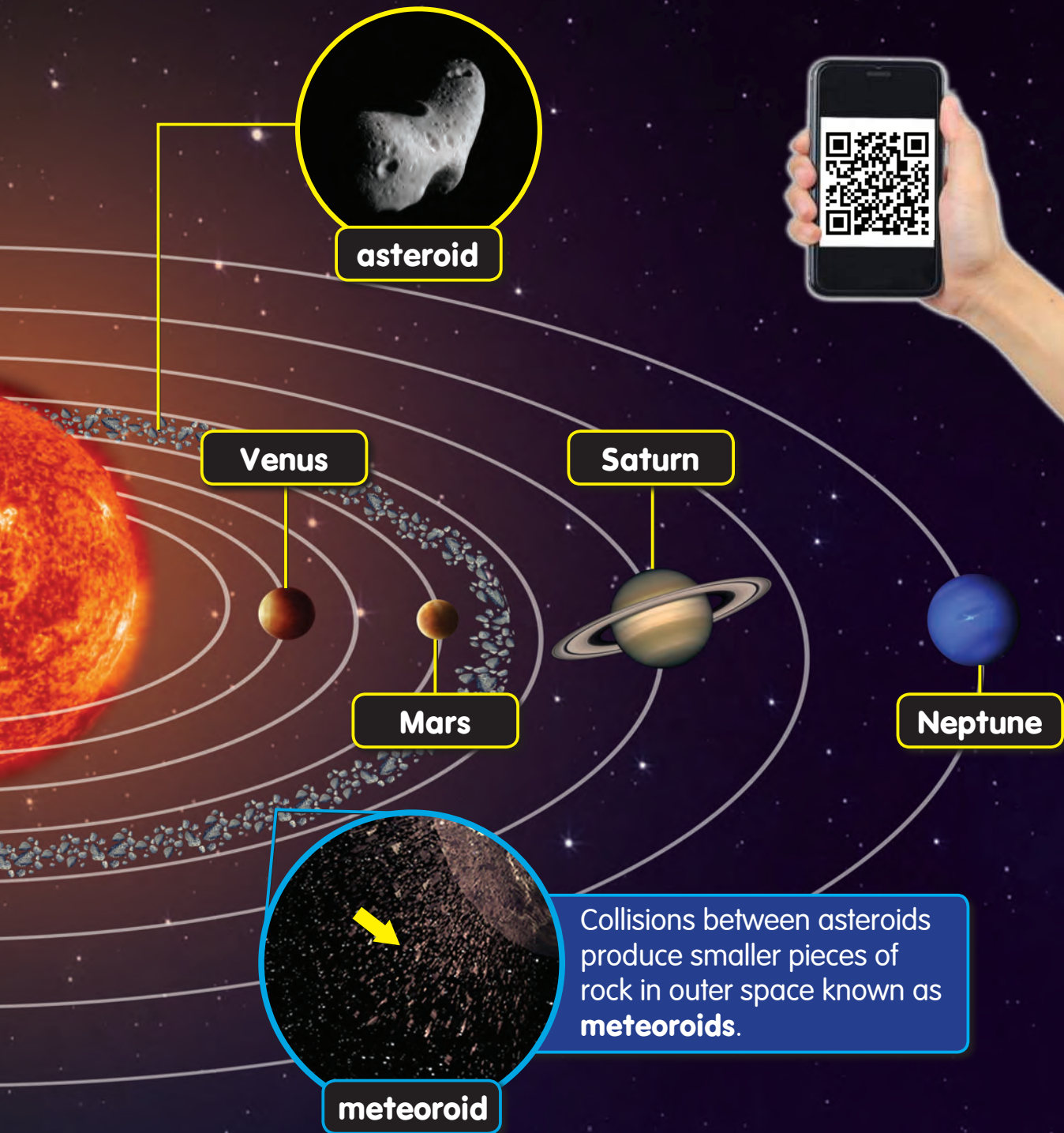
The Sun, which is the centre of the Solar System, is surrounded by other members of the Solar System.

Where is the position of the Sun in the Solar System?

TEACHER'S NOTES

9.1.1

- The illustration of the Solar System is not to scale.



State the sequence of the planets in the Solar System starting from the Sun.

TEACHER'S NOTES

- Pluto was once classified as the 9th planet of the Solar System. It was classified as a dwarf planet in 2006.
- Facts about the planets in the Solar System are available at <https://solarsystem.nasa.gov/planets/>

Activity Book

Pages:

77-79,
84



Fun Activity Solar System Balloons



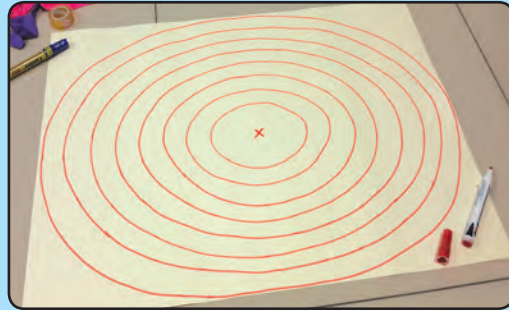
Apparatus and Materials

- adhesive tape
- balloons
- marker pen
- manila cardboard

Steps



1. Blow up the balloons according to the estimated sizes of the Sun and the eight planets.



2. Mark 'X' at the centre of the manila cardboard. Then, draw eight circles of different sizes.



3. Attach the balloons onto the circular lines according to the sequence of planets in the Solar System.



4. Label every planet. Draw the asteroids, meteoroids, and comets on the manila cardboard.

5. Present your Solar System Balloons to the class.

Questions

1. List the members of the Solar System.
2. Where is the asteroid located in the Solar System?



Fun Activity Interactive Card

ACTIVE
INDIVIDUAL

Apparatus and Materials

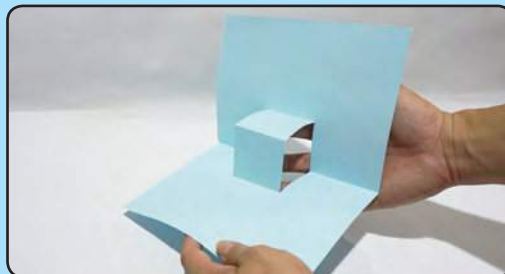
- scissors **Caution:**
- coloured paper
- pictures of planets
- glue

Steps

Caution:

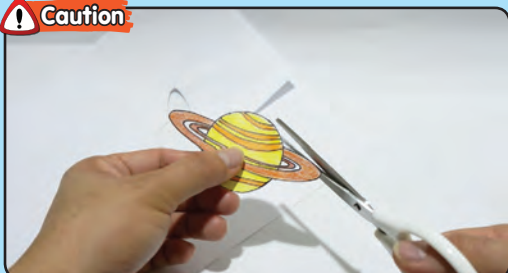


1. Fold the paper in half. Then, cut the centre part of the fold as in the diagram.



2. Push the fold between the two cuts upwards.

Caution:



3. Cut the picture of the planet and paste it on the upward fold of the card.



4. Write information about the planet on the cardboard. Decorate the card creatively.

5. Repeat steps 1 to 4 for other members of the Solar System.

Question

Besides Saturn, which planet has a ring?

TEACHER'S NOTES

- More information about the members of the Solar System is available at <https://solarsystem.nasa.gov/>

Temperature of the Planets

Is the temperature of every planet the same?
Let us follow the conversation between Lim and his friends.

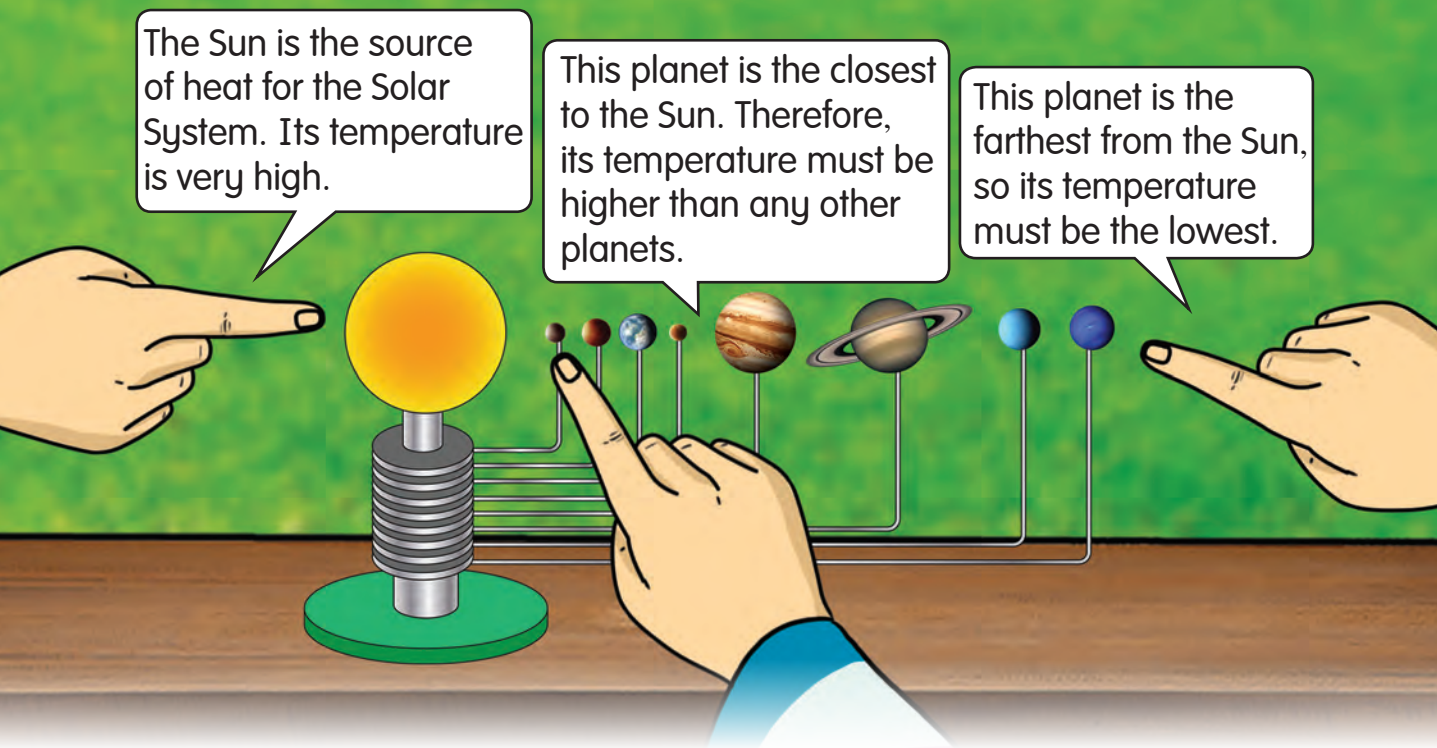
Lim, why are you sweating?

It's hot here!

We don't feel hot over here.

It's hot here because I'm standing near the fire.

Oh! Can we relate this situation to the temperature of the planets that we're learning about?



The Sun is the source of heat for the Solar System. Its temperature is very high.

This planet is the closest to the Sun. Therefore, its temperature must be higher than any other planets.

This planet is the farthest from the Sun, so its temperature must be the lowest.

What can you state about the temperature of the planets?

The temperature of the nearest planet to the Sun is higher than the temperature of the farthest planet from the Sun.

However, Venus has the highest temperature in the Solar System because of its thick atmosphere that traps heat.



HOTS

If the Earth were located in Uranus's position, would it be suitable for life? Why?

TEACHER'S NOTES

- An atmosphere is a layer of gas that surrounds a planet.
- An interactive activity on planet temperature can be found at <https://bukuteks.dbp.gov.my/media.php?id=I336>

Activity Book
Pages:

80-81

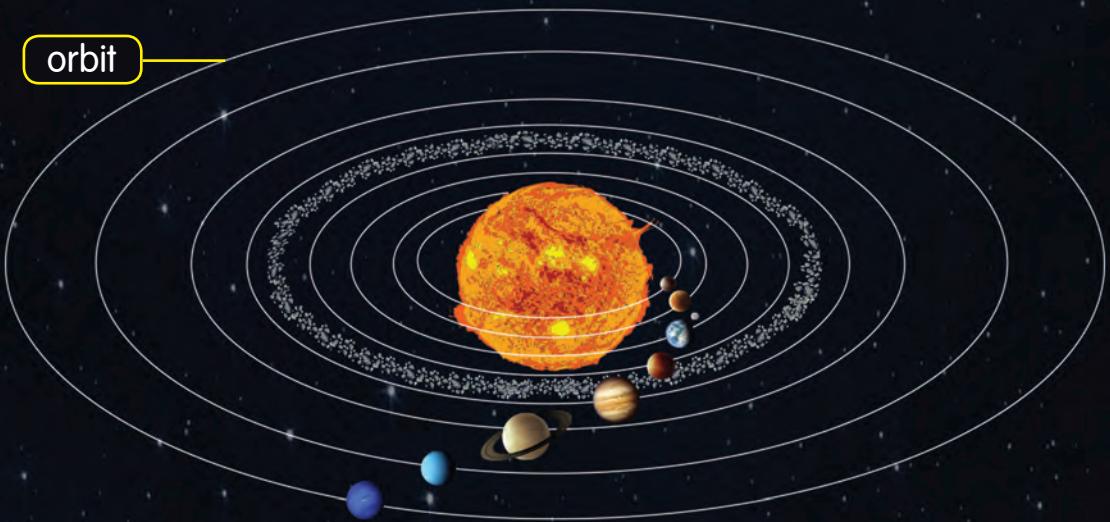
Orbit of Planets

The car is moving very fast on the track!



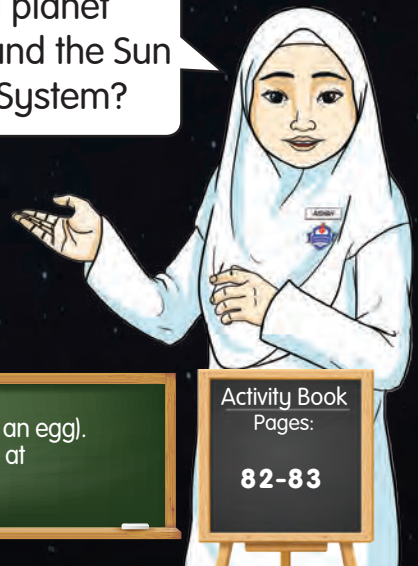
Just like the car track, each planet revolves around the Sun in its own path called an **orbit**.

orbit



The orbit is an elliptical imaginary path that goes around the Sun in space.

How does a planet revolve around the Sun in the Solar System?



TEACHER'S NOTES

- An ellipse is a regular oval shape (almost like the shape of an egg).
- An interactive activity on the orbits of planets can be found at <https://bukuteks.dbp.gov.my/media.php?id=1337>

9.1.3

Activity Book
Pages:

82-83



Fun Activity

An Orrery of the Solar System



Apparatus and Materials

- ruler
- adhesive tape
- scissors
- cardboard
- coloured pencils
- cutter
- paper cup
- paper fastener
- hole punch

Steps



1. Draw and cut pictures of the Sun and the planets.



2. Cut the cardboard into eight strips of different lengths.



3. Paste the picture of each planet at one end of every strip in a sequence.



4. Make a hole at the other end of each strip and at the bottom of the paper cup.



5. Tie all the strips together at the bottom of the paper cup using the paper fastener.



6. Paste the picture of the Sun at the centre of the model and label it.

7. Discuss the Solar System using the orrery model.

Questions

1. What does the length of the strips in the orrery model represent?
2. State the planets in sequence starting from the nearest to the Sun.



q.1.3
q.1.5

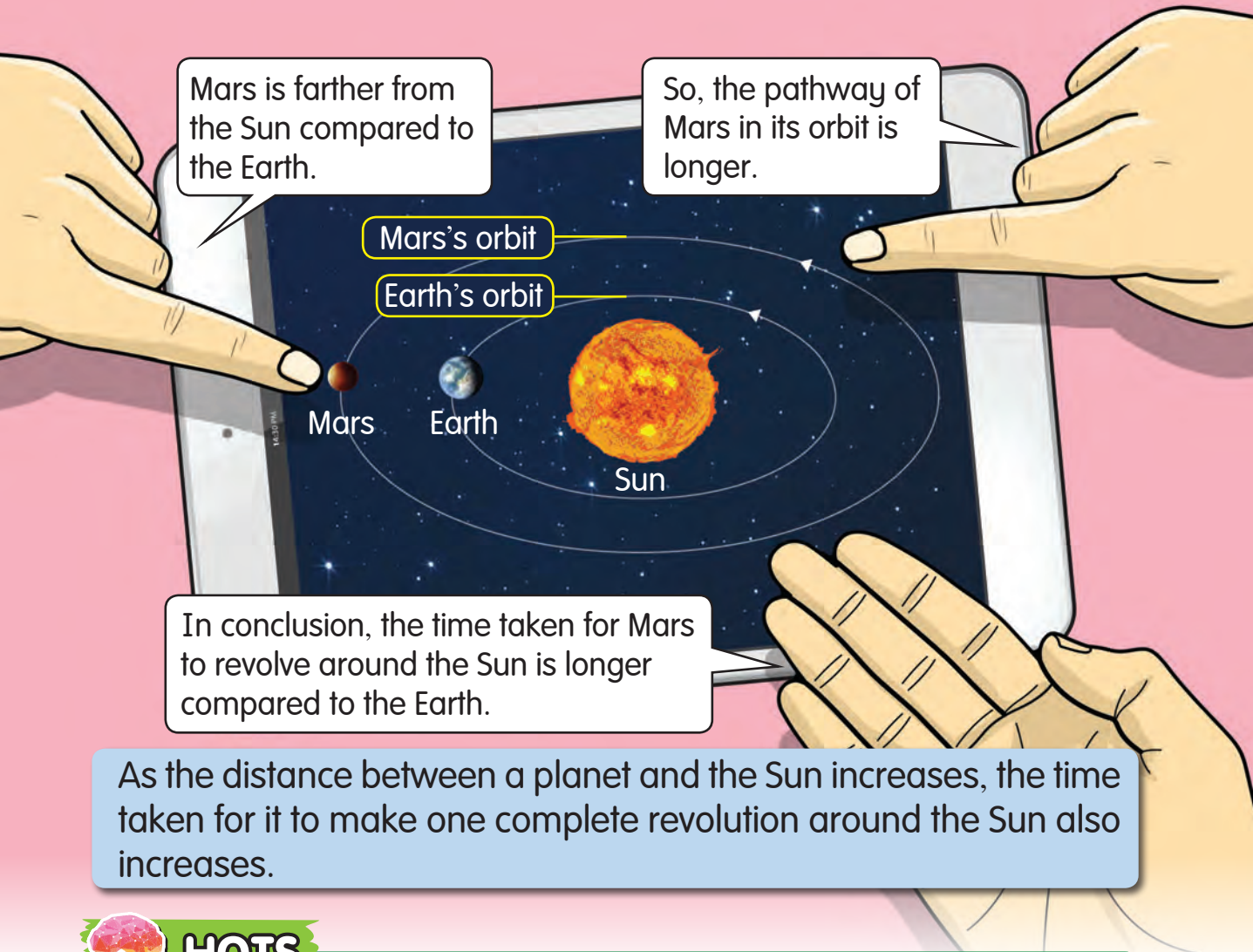
TEACHER'S NOTES

- An orrery is a special type of clockwork model invented by George Graham to compare the position and movement of the planets in the Solar System.

Revolution Time of the Planets

The time taken for each planet to revolve around the Sun is different. Observe the situation below.

What is the difference between the Earth's orbit and Mars's orbit?



HOTS

The Earth takes one year to make one complete revolution around the Sun. Compare the time taken for other planets to revolve around the Sun in the unit of Earth Year.

TEACHER'S NOTES

- Earth Year is a unit for the time taken by the Earth to make one complete revolution around the Sun.

9.1.4

Activity Book
Page:

83



Let's Test Relating the Distance of Planets from the Sun and the Time Taken to Make One Revolution

Apparatus and Materials

- stopwatch
- wooden pole
- long rope
- adhesive tape

Steps

1. Stick a wooden pole in the field.
2. Mark eight different lengths on the rope.
3. Tie the rope to the pole and hold the other end of the rope.
4. Mark the starting position using adhesive tape and move around the pole to make one complete circle.
5. Record the time taken as in Table A.
6. Repeat steps 3 to 5 using different lengths of the rope.

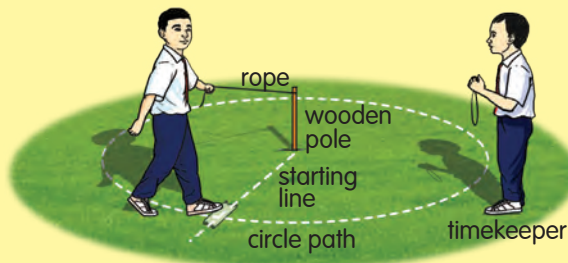


Table A

Length of rope (m)	Time taken to make one complete circle (seconds)
1	
2	
3	
4	
5	
6	
7	
8	

Question

What is the relationship between the distance of your position from the centre of the circle and the time you revolve around the centre of the circle?



Leisure Science My Planet Lantern

Steps

1. Cut and write information about planets on coloured paper strips.
2. Attach the coloured paper strips together using a paper fastener.
3. Form the coloured paper strips into a sphere.
4. Decorate your Planet Lantern.



TEACHER'S NOTES

- The time of a revolution is the time taken to make one complete circle.

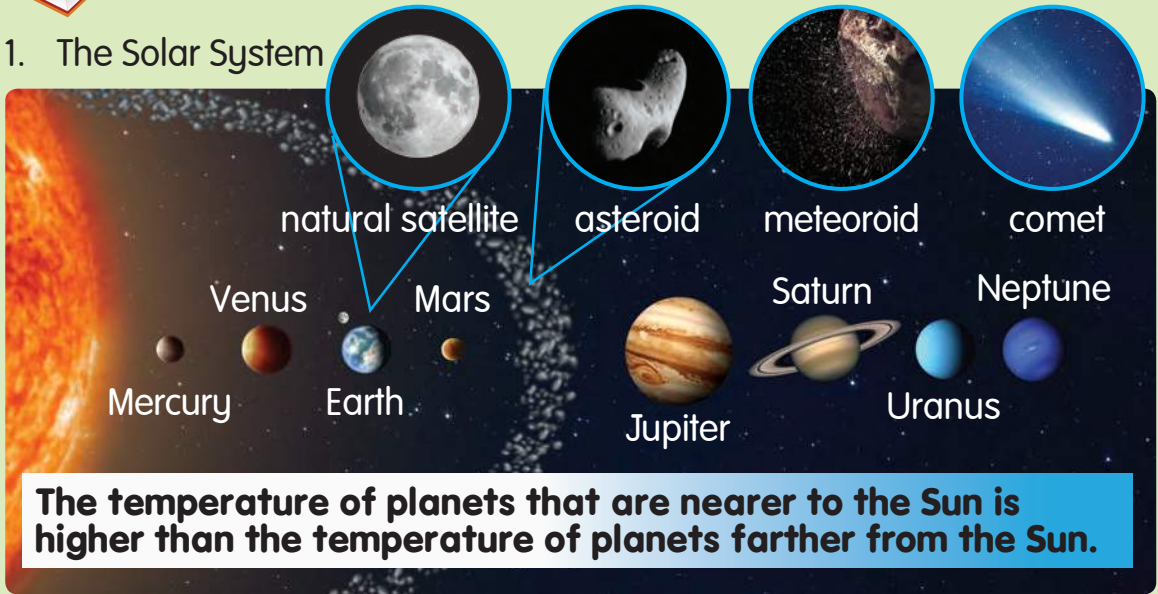
Activity Book Pages:

83-84



Let's Remember

1. The Solar System



The temperature of planets that are nearer to the Sun is higher than the temperature of planets farther from the Sun.

- All planets revolve around the Sun in their orbits.
- As the distance between a planet and the Sun increases, the time taken for it to make one complete revolution around the Sun also increases.



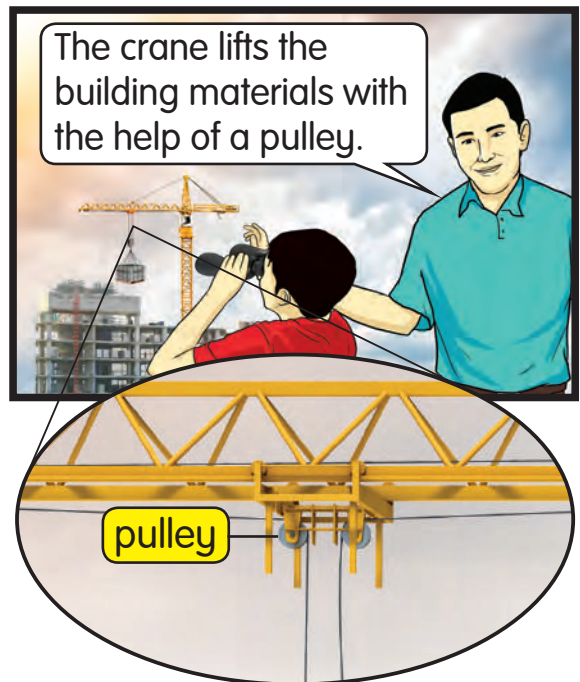
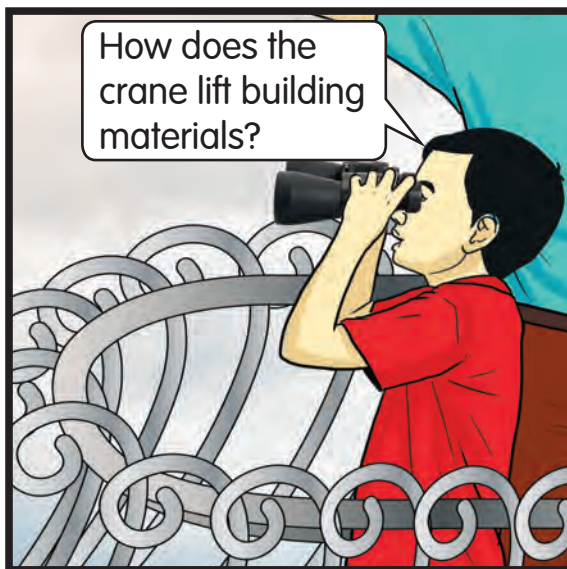
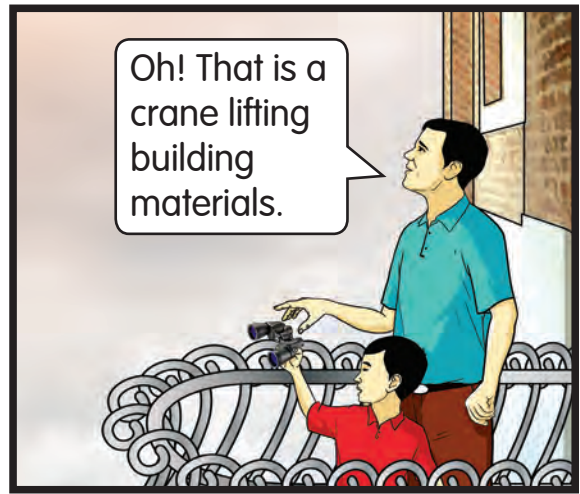
Let's Answer

Answer all the questions in the Science exercise book.

- What is the position of the Earth in the sequence of planets around the Sun?
- What are the objects located between Mars and Jupiter?
- is the coldest planet in the Solar System.
- Uranus revolves around the in its orbit.
- Arrange the planets in sequence of increasing planet temperature.
 (Earth) (Jupiter) (Neptune) (Saturn) (Venus)
- Which planet requires the least time to make one complete revolution around the Sun? Why?



Lim and his father are chatting on the balcony of their house.



Where can you see pulleys other than in the situation above?

Pulleys

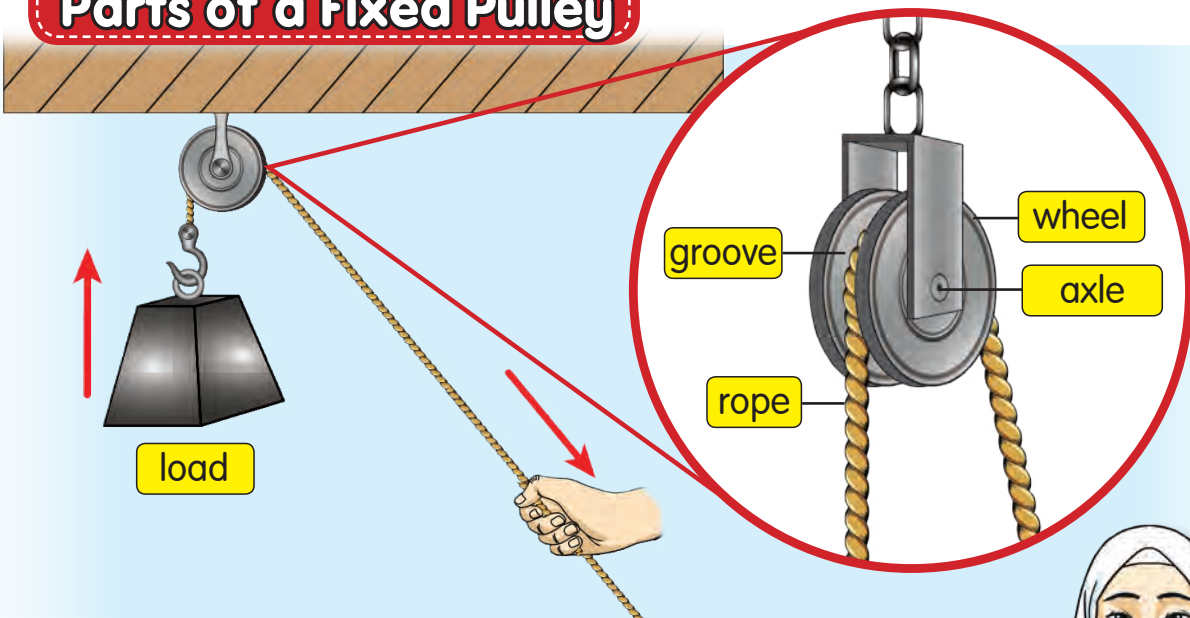


It moves using a pulley.

How does this cable car move?

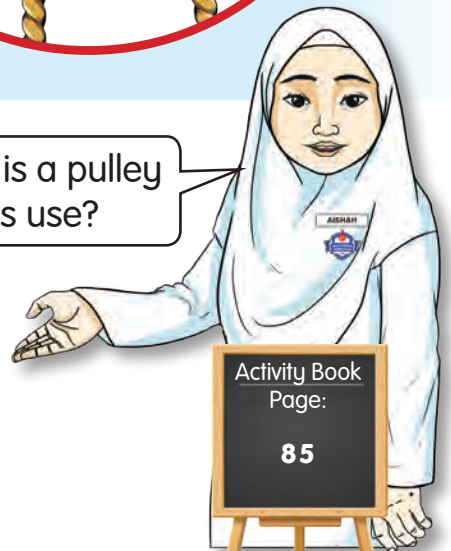
Pulley is an example of a simple machine which enables load to be lifted easily using lesser force.

Parts of a Fixed Pulley



A fixed pulley has a wheel with a groove that enables a rope to pass through it.

What is a pulley and its use?



Activity Book
Page:

85

10.1.1

The Functions of a Fixed Pulley

This is a crane model. It has a base, pole, arm, **pulley**, and rope. How does this model work?



The fixed pulley on the crane model works when all the components are connected. What are the components?



base



pole



arm



load



1 yellow pulley
(acts as a motor)



rope



1 black pulley
(acts as a fixed pulley)

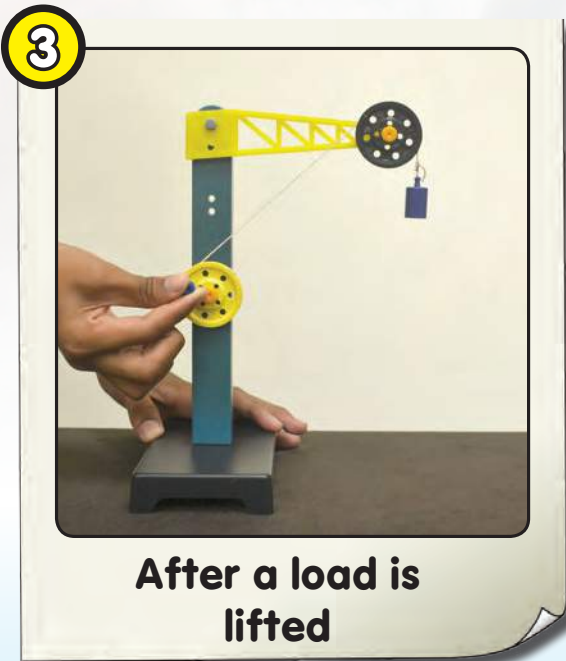
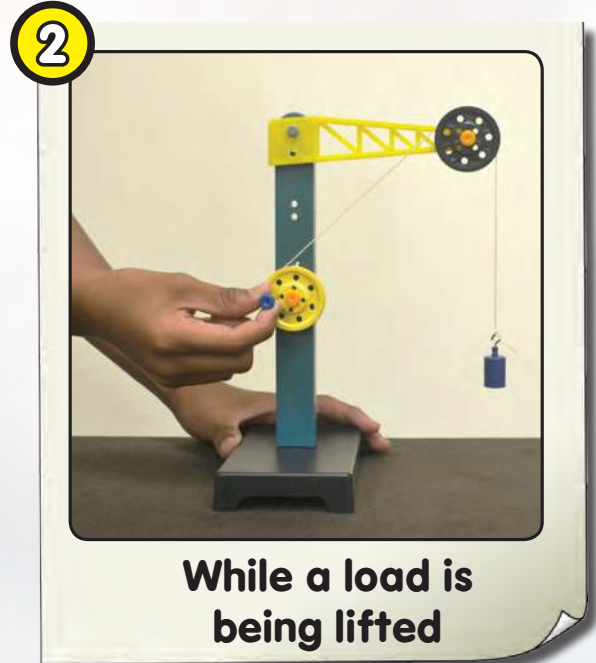
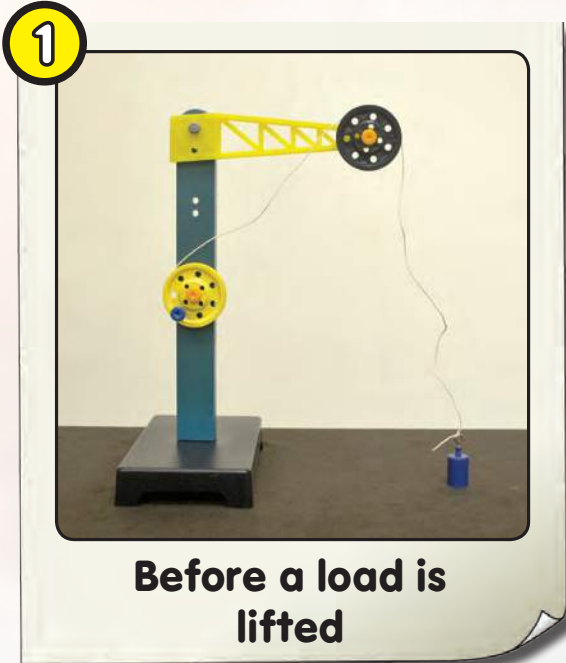


10.1.2

TEACHER'S NOTES

- Any suitable model other than the model shown can be used.

How does the fixed pulley work on the crane model?



When the rope is pulled, the load will be lifted upwards by the fixed pulley.

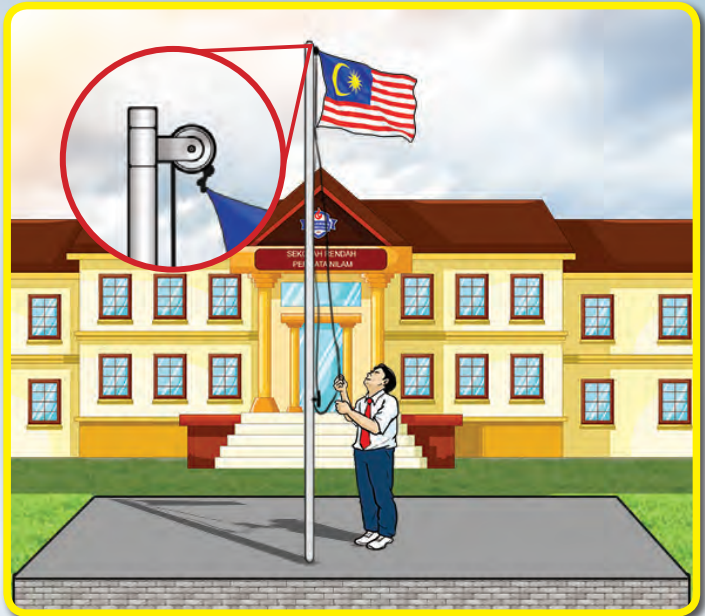


What about the pulley model you use in school? Explain how the pulley model works.

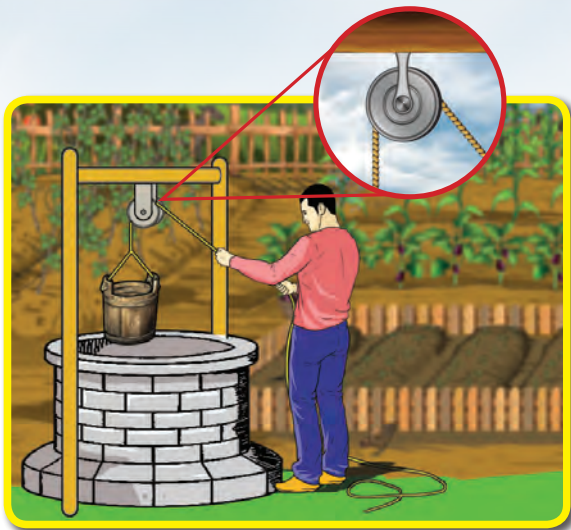
Uses of Pulleys

What are the examples of pulleys used in our life?

What will happen if the flagpole does not have a pulley?



What is the difference between lifting a bucket of water from the well using a pulley and without using a pulley? Which is easier? Why?

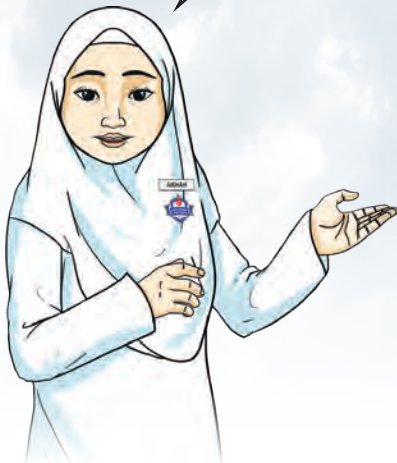




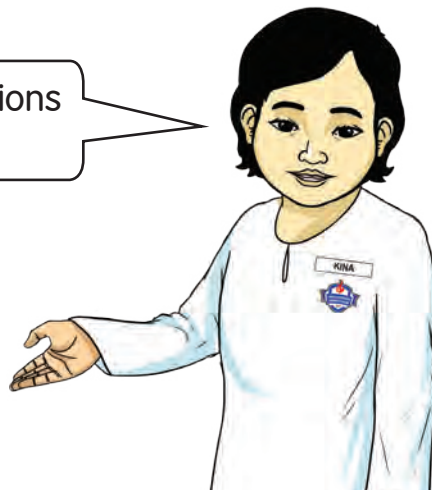
What will happen if the fishing nets are not pulled using a pulley?



What will happen if the heavy objects are lifted without using a pulley?



What are other applications of pulleys in our life?



Activity Book
Pages:

87-89

Invent a Functioning Pulley Model

Pulleys make lifting load easier. How would you build a functioning pulley model to solve the problem of lifting loads?

1 Identifying the Problem

The residents of the apartment are carrying water from a lorry because the water supply has been cut off.



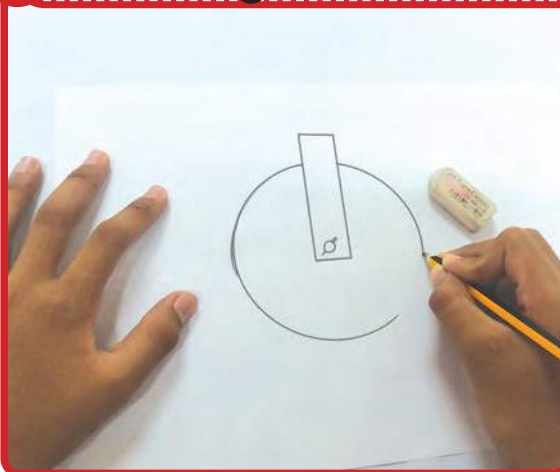
2 Generating an Idea

I suggest we make a pulley.

Let's build a functioning pulley model. We can use recycled materials.



3 Sketching Out Ideas



4 Preparing Apparatus and Materials



10.1.4
10.1.5

TEACHER'S NOTES

- A pulley model can be built according to pupils' creativity and is not limited to the example above.

Activity Book
Page:

90

5 Building a Pulley Model



Measure, mark, and cut the box and the bottle.



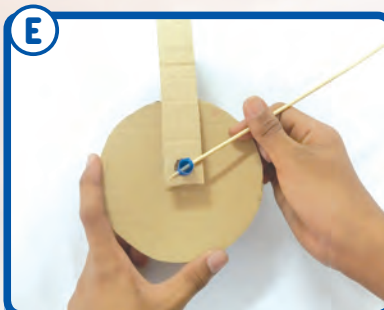
Make a hole in the centre of the box.



Attach the parts of the box to the bottle that has been cut.



Insert a straw into the hole to make an axle.

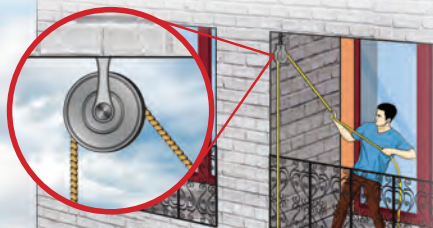


Pierce the stick through the end of the straw.

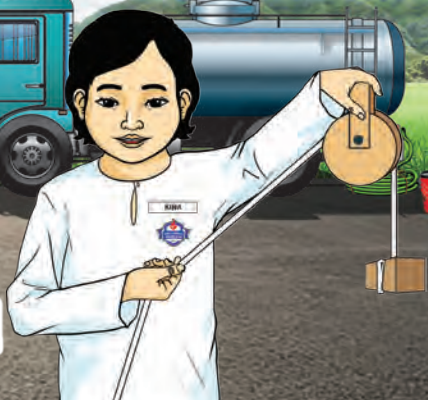


Hang and test the completed pulley.

This pulley model has been used to produce a fixed pulley that can lift water to the upper floor.



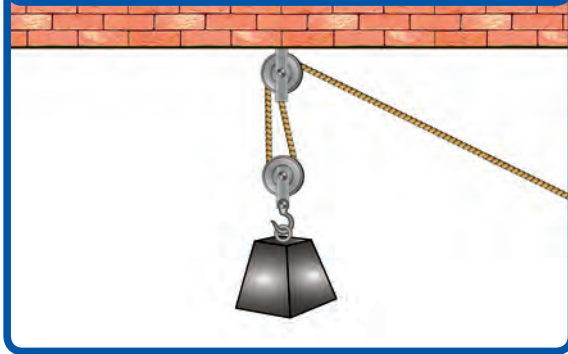
Build a workable pulley model in a creative way.



Types of Pulleys

Besides the fixed pulley, there are several types of pulleys such as **compound pulleys** and **movable pulleys**.

Compound pulley



Movable pulley

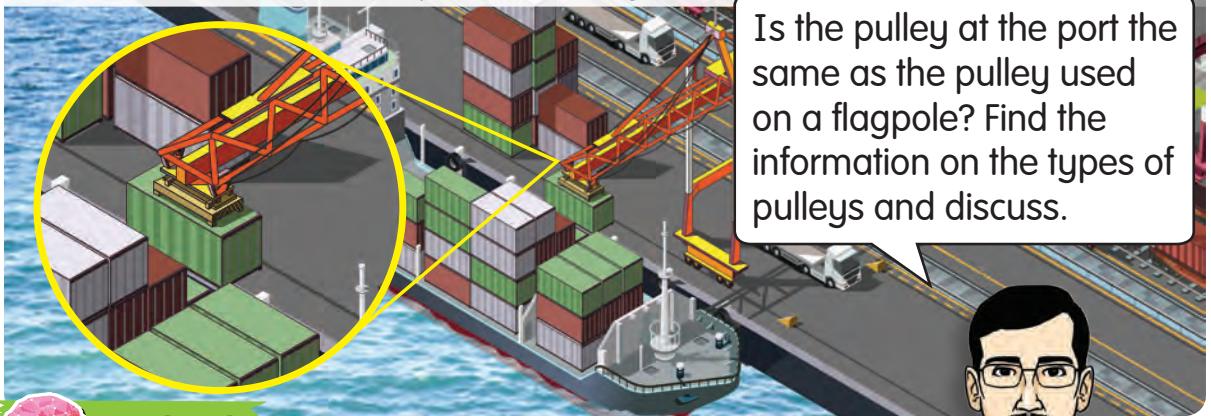


Where can we find the use of these pulleys?

Find information on the types of pulleys from various media.

At the Port

A pulley on a crane makes it easier to unload a shipping container from the ship to the lorry.

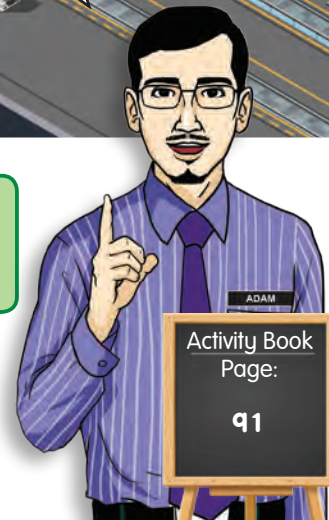


HOTS

How does the pulley move a heavy container from the ship to the lorry easily?



10.1.3
10.1.5



Activity Book
Page:

91

At the Construction Site

A pulley on a crane makes lifting the building materials easier.



HOTS

What will happen to the process of constructing a building if pulleys are not used?



Leisure Science

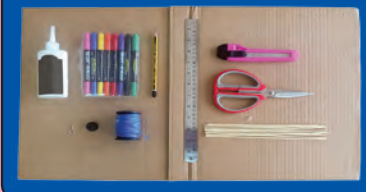
My Crane Model

Steps

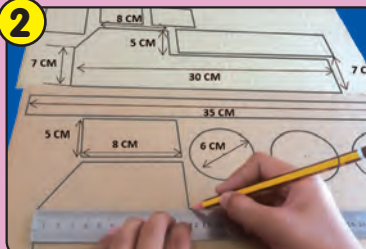
Build a crane model using recycled materials such as boxes and sticks.

1

Caution



2



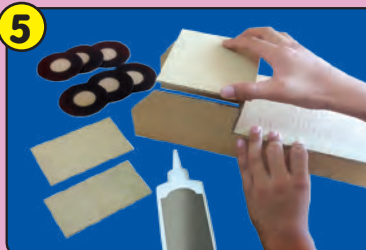
3



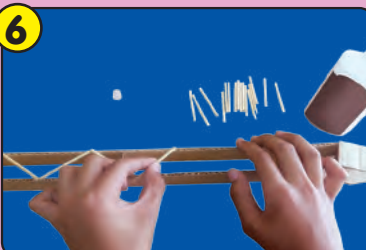
4



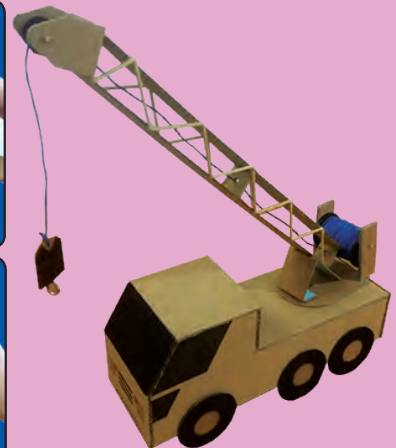
5



6



7



Activity Book
Page:

92

Let's Remember

1. A pulley is a type of simple machine used to lift loads easily.
2. A fixed pulley contains several components:
 - (i) groove
 - (ii) wheel
 - (iii) rope
 - (iv) axle
3. A pulley functions when the rope is pulled through the groove to lift the load.
4. Besides fixed pulleys, there are other types of pulleys used to make work easier, such as pulleys used at construction sites and at ports.
5. Examples of the application of fixed pulleys in our life are:
 - (i) raising the flag
 - (ii) lifting water from a well
 - (iii) pulling up fishing nets
 - (iv) lifting building materials

Let's Answer

Answer all the questions in the Science exercise book.

1. What is a pulley?
2. Name the parts of a pulley.
3. Based on Figure 1, explain how the load is lifted.

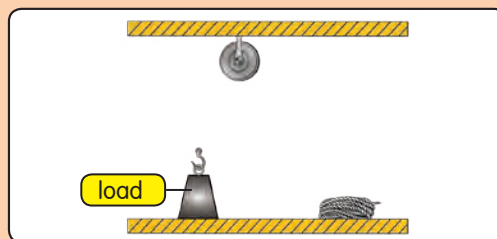
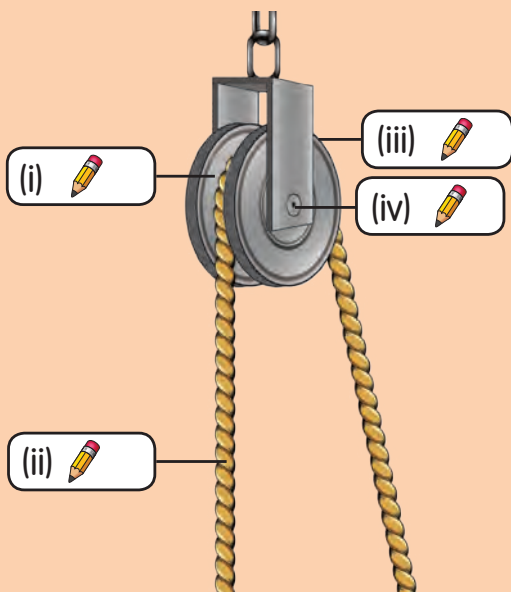


Figure 1

4. List two uses of pulleys in our daily activities.
5. State the functions of pulleys at the following places:
 - (i) construction site
 - (ii) port



ANSWERS

Unit 1: Scientific Skills

HOTS suggested answer (page 7)

No, because the measuring tool used is different.

Let's Answer (page 22)

- Sight, smell, taste, touch
- Animals with four legs, Animals with fur
- length
- Green or blue
- Not enough electrical energy, the dry cells are not fastened, bulb is damaged.
- graph
- (i) False (ii) True (iii) False (iv) True
- After completing a science investigation, we should clean, dry, and store away the science apparatus properly.

HOTS suggested answer (page 22)

Advise my friend and tell him about the steps that should be taken when disposing of soil specimen, as the sink will be clogged if the soil specimen is thrown into it.

Unit 2: Science Room Rules

Let's Answer (page 28)

- Line up before entering the Science Room, do not eat in the Science Room, place all bags outside the Science Room, turn off the switches before leaving the Science Room, carry out activities in the teacher's presence.
- Not enough air and light may cause the activity to be carried out in an uncomfortable condition.
- No, because it will spoil the table top in the Science Room.
- (i) the hand lens and specimen will be damaged.
(ii) the hand lens and specimen will not be damaged.
- Report to the teacher immediately.

HOTS suggested answer (page 28)

These rules can be practised in other special rooms such as the resource centre, music room, computer room, RBT workshop, prayer room and others.

Unit 3: Humans

HOTS suggested answer (page 36)

Teeth would not last long. The number of teeth would not be enough for an adult. Teeth would be small and not strong.

Let's Answer (pages 57-58)

- Incisors are for cutting food, canines are for tearing food, and molars are for grinding food into small pieces.
- (i) enamel (ii) dentine (iii) gum (iv) nerves (v) blood vessels
-

Milk Teeth Set	Permanent Teeth Set
There are 20 teeth: • 8 incisors • 4 canines • 8 molars	There are 32 teeth: • 8 incisors • 4 canines • 20 molars
Thin layers of enamel and dentine.	Hard layers of enamel and dentine.
Teeth are smaller and not strong.	Teeth are bigger and stronger.
Teeth are not permanent. They last for a short time.	Teeth are permanent. They last for a longer time.
Teeth start to grow at 6 months old and are complete at 3 years old.	Teeth start to grow at 6 years old and are complete at 21 years old.
Both sets have the same types of teeth, which are incisors, canines, and molars.	

- Rinse the mouth, brush the teeth or use floss.
- Protein - Fish, Carbohydrate - Bread
- To keep the body warm
- Papaya Tomatoes
- (i) Yes (ii) This is because *nasi lemak* contains all the food classes from every level of the Malaysian Food Pyramid.
- A balanced diet helps to keep our bodies healthy.
- Digestion is a process to break down food into small parts so that the nutrients from food are easily absorbed by the body.
- P - Mouth, Q - Oesophagus, R - Stomach, S - Intestine, T - Anus
- It will be removed from the body through the anus as faeces.
- (iii) eating in the park.

HOTS suggested answer (page 58)

Because the body's requirement for each food class is different depending on age, sex, occupation, and health condition of a person.

Unit 4: Animals

HOTS suggested answer (page 64)

Not all omnivores have the same set of teeth because certain omnivores do not have teeth, such as chickens and doves.

Let's Answer (page 70)

- (i) Omnivore because bat eats fruits and insects
(ii) Carnivore because frog eats other animals only
(iii) Herbivore because cow eats plants only
- (i) goats and rabbits (ii) eagles and tigers (iii) chickens and monkeys
- (i) Other animals (ii) plants
(iii) Other animals and plants

- (i) lions and wolves (ii) orangutans and chimpanzees (iii) giraffes and goats
- Incisors to cut food and molars to grind food into small pieces.

HOTS suggested answer (page 70)

Animals would adapt to their environment by looking for sources of food that can be eaten for their survival.

Unit 5: Plants

Let's Answer (page 78)

- (a) (i) stem cutting (ii) underground stems (iii) spores
(b) (i) tapioca (ii) ginger (iii) ferns
- The reproduction of plants is important for life so that food sources, habitat, oxygen, and supply of wood will be conserved and will always be available.
- Water spinach and sweet potato
- Orchids and bananas

Unit 6: Measurement

Let's Answer (page 94)

- (i) two square centimetres (ii) ten cubic centimetres
- graph, squares
- 7 cm²
- (i) 10 m^l (ii) 30 m^l
- (i) 12 cm³ (ii) 27 cm³
- Wastage or not enough files

HOTS suggested answer (page 94)



Unit 7: Density

Let's Answer (page 104)

- apple and quill
- more
- float, less
- A life jacket will float on the surface of the water because it is less dense than water, so it can prevent someone from drowning.

HOTS suggested answer (page 104)

Peel the skin of the orange.

Unit 8: Acid and Alkali

HOTS suggested answer (page 106)

No, because the litmus paper needs to be moist before testing a dry substance. A liquid substance needs to be dropped onto the litmus paper.

Let's Answer (page 114)

- litmus paper
- (i) Property of X - Neutral ; Property of Y - Alkaline ; Property of Z - Acidic
(ii) Substance X - Drinking water ; Substance Y - Soap ; Substance Z - Lemon juice
- turmeric, purple cabbage, hibiscus
- Taste and touch cannot be a scientific indicator because most bitter substances that are slippery when touched are alkaline. However, bitter gourd is acidic as it changes litmus paper from blue to red.

HOTS suggested answer (page 114)

Toothpaste can neutralise acid in the mouth.

Unit 9: The Solar System

HOTS suggested answer (page 121)

The Earth would no longer be suitable for life because it would be too cold.

HOTS suggested answer (page 124)

Mercury and Venus take less than one Earth Year to revolve around the Sun, whereas Mars, Jupiter, Saturn, Uranus, and Neptune take longer than one Earth Year.

Let's Answer (page 126)

- Third 4. Sun
- Asteroid 5. Neptune, Saturn, Jupiter, Earth, and Venus
- Neptune 6. Mercury, because its orbit is the smallest.

Unit 10: Machine

HOTS suggested answer (page 135)

The pulley on the crane at the port can lift up a heavy shipping container using lesser force. Therefore, the heavy shipping container can be moved from the ship to the lorry easily.

HOTS suggested answer (page 136)

The process of constructing a building without the use of pulleys will take a longer time and need more workers.

Let's Answer (page 137)

- A pulley is a simple machine that makes the lifting of loads easier using a lesser force.
- (i) groove (ii) rope (iii) wheel (iv) axle
- The load can be lifted when the connected rope is pulled through the groove. When the rope is pulled, the wheel turns and the load is lifted upwards.
- Raise a flag, lift a bucket of water from a well, pull the fishing nets
- (i) lifting construction materials (ii) easing the unloading of a shipping container

Dengan ini, **SAYA BERJANJI** akan menjaga buku ini dengan baiknya dan bertanggungjawab atas kehilangannya, serta mengembalikannya kepada pihak sekolah pada tarikh yang ditetapkan.

Skim Pinjaman Buku Teks			
Sekolah _____			
Tahun	Darjah	Nama Penerima	Tarikh Terima

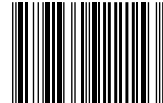
Nombor Perolehan: _____

Tarikh Penerimaan: _____

BUKU INI TIDAK BOLEH DIJUAL



ISBN 978-983-49-2215-3



9 789834 922153

BT073005