TEACHER'S GUIDE

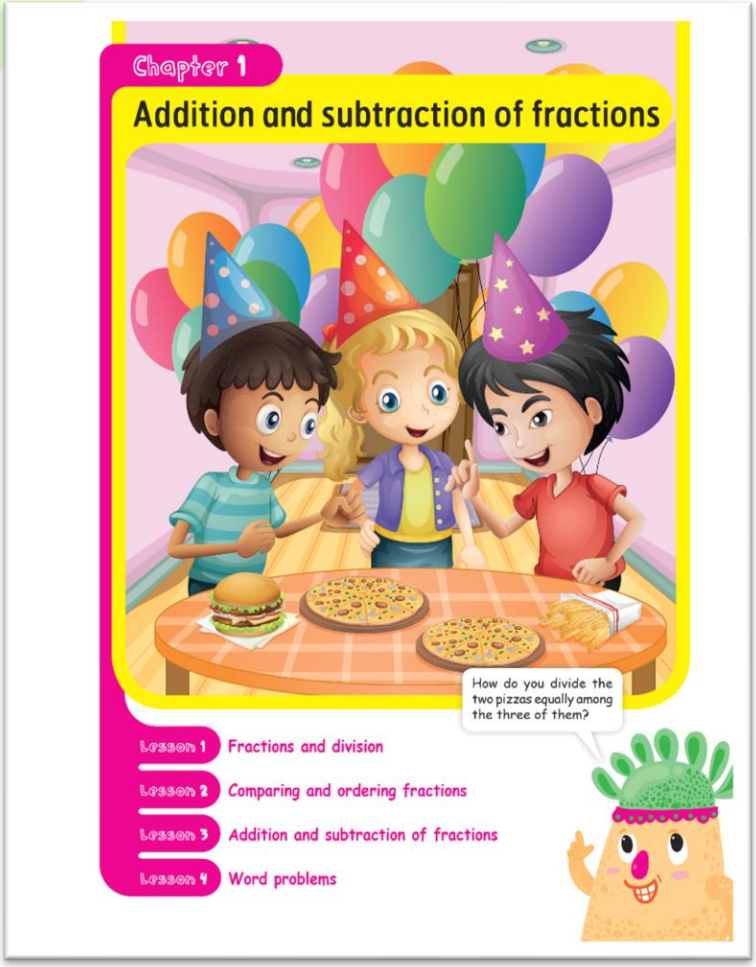
Go Get Maths 5

A perfect fusion of Thai Syllabus and Singapore Maths approach

Textbook
Prathomsuksa 5

Based on the Basic Education Curriculum
B.E. 2551 (Revised Edition B.E. 2560)

Chapter 1
Addition and subtraction of fractions



The big idea

1. Ask the students these questions to start a discussion:
   - Have you organized or attended a birthday party before?
   - Were there a lot of people?
2. Ask the students to look at the picture carefully. Ask them these questions:
   - How many children are there?
   - How many pizzas are there?
   - How many burgers are there?
   - If you want to divide the burger among the children evenly, how many parts will you cut the burger into?
   - If you want to divide the pizzas among the children evenly, how many parts will you cut each of the pizzas into?

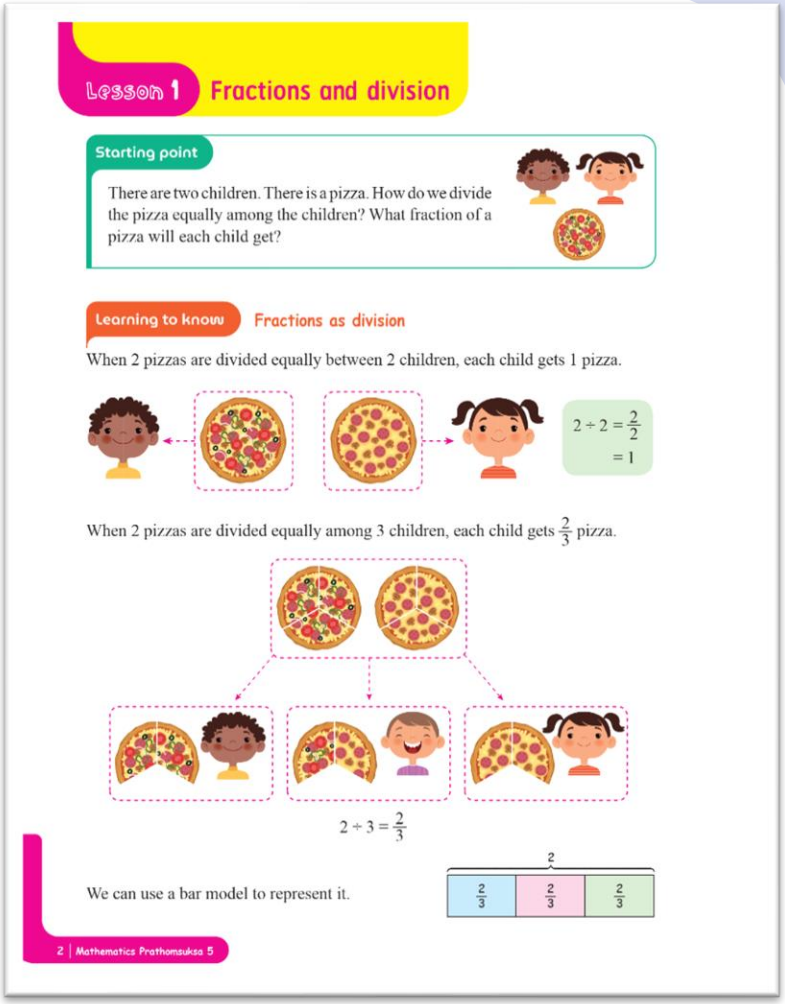
Strand 1: Numbers and algebra

Standard M.1.1 Numbers

Indicators:

M 1.1 Gr5/3 Find the results of adding and subtracting fractions and mixed numbers.

M 1.1 Gr5/5 Show mathematical methods of finding answers of 2- step word problems of addition, subtraction, multiplication and division.


Lesson 1 Fractions and division

Starting point

There are two children. There is a pizza. How do we divide the pizza equally among the children? What fraction of a pizza will each child get?

Learning to know Fractions as division

When 2 pizzas are divided equally between 2 children, each child gets 1 pizza.

$2 \div 2 = \frac{2}{2} = 1$

When 2 pizzas are divided equally among 3 children, each child gets $\frac{2}{3}$ pizza.

$2 \div 3 = \frac{2}{3}$

We can use a bar model to represent it.

2

$\frac{2}{3}$ $\frac{2}{3}$ $\frac{2}{3}$

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Lesson 1
Fractions and division

Lesson objectives

By the end of the lesson, the students should be able to:

1. Use fractions to represent division.

Suggested teaching time

2 periods (2 x 50 minutes)

Vocabulary

Fraction, division

Materials needed

Pictures of a pizza

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Show the students a picture of a pizza. Get 2 students to the front of the class. Tell the students that you want to divide the pizza between them. Ask the rest of the students these questions:
   - Will each of the students get a whole pizza?
   - How should we divide the pizza?
   - What fraction of a pizza will each of them get?
2. Repeat with 2 pictures of pizzas and 3 students.
3. Guide them to understand fractions as division using the examples in the book.

Extra notes

Guide them to realize fractions as division by giving them these examples:

$\frac{1}{2}$ (1 pizza is shared between 2 children)

$\frac{2}{3}$ (2 pizzas are shared among 3 children)

$\frac{4}{7}$ (4 pizzas are shared among 7 children)

Teaching ideas

4. Use the examples to explain further.
5. Emphasis on the meaning of the 'divided by (÷)' symbol as "equally shared among."

$$3 \div 4 = \frac{3}{4}$$

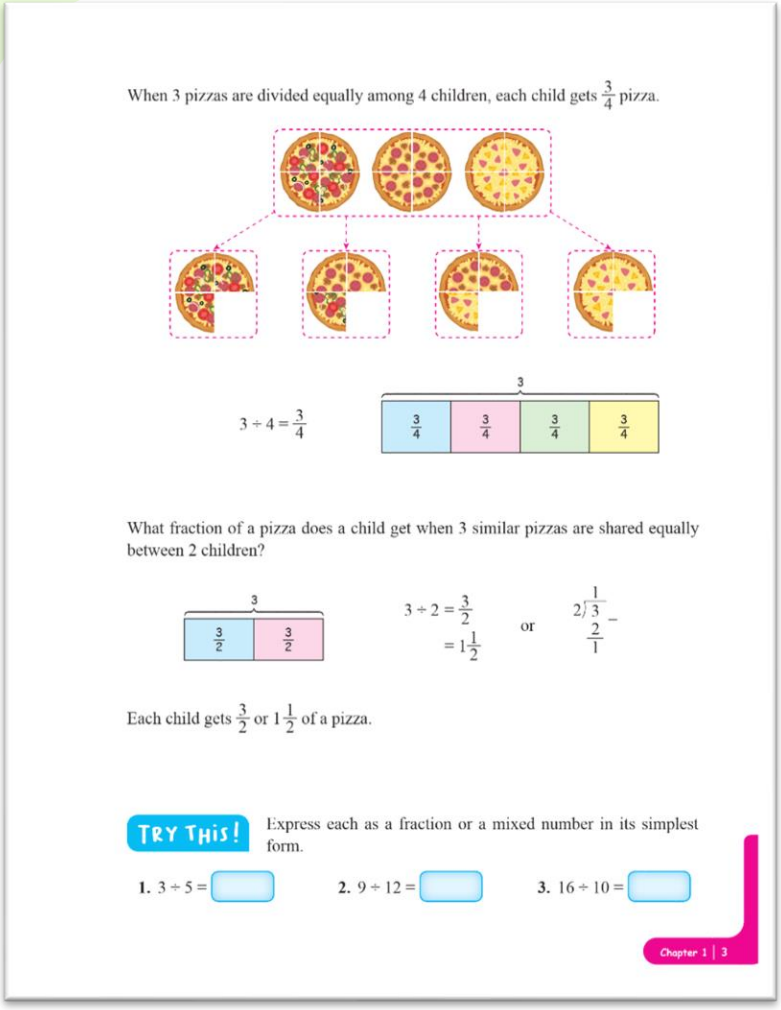
6. Use a bar model to show the division.
7. Guide the students to refer to **Starting Point** on page 2. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 1 to 4 in Go Get Maths Workbook P5.



When 3 pizzas are divided equally among 4 children, each child gets $\frac{3}{4}$ pizza.

$3 \div 4 = \frac{3}{4}$

What fraction of a pizza does a child get when 3 similar pizzas are shared equally between 2 children?

$3 \div 2 = \frac{3}{2}$

$= 1\frac{1}{2}$

or $2\overline{)3}$ $\frac{2}{1}$ $\frac{1}{-}$

Each child gets $\frac{3}{2}$ or $1\frac{1}{2}$ of a pizza.

TRY THIS! Express each as a fraction or a mixed number in its simplest form.

1. $3 \div 5 =$ ____
2. $9 \div 12 =$ ____
3. $16 \div 10 =$ ____

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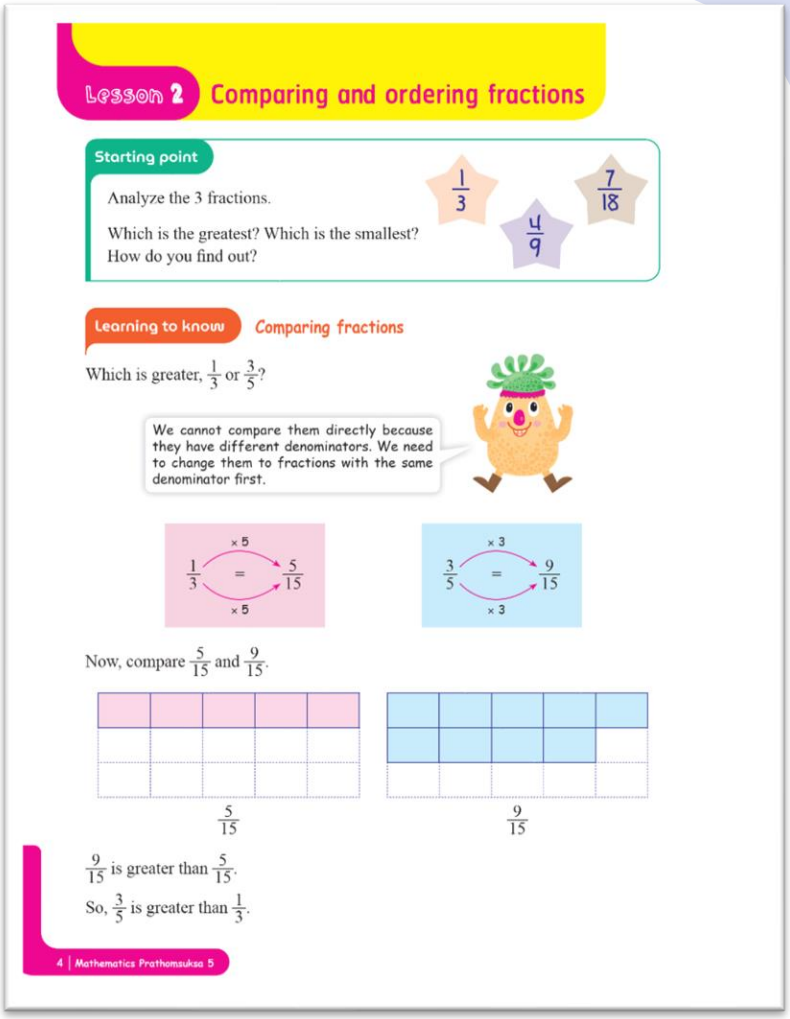

Lesson 2 Comparing and ordering fractions

Starting point

Analyze the 3 fractions.

Which is the greatest? Which is the smallest?
How do you find out?

$\frac{1}{3}$ $\frac{4}{9}$ $\frac{7}{18}$

Learning to know Comparing fractions

Which is greater, $\frac{1}{3}$ or $\frac{3}{5}$?

We cannot compare them directly because they have different denominators. We need to change them to fractions with the same denominator first.

$\frac{1}{3} \times 5 = \frac{5}{15}$ (×5)

$\frac{3}{5} \times 3 = \frac{9}{15}$ (×3)

Now, compare $\frac{5}{15}$ and $\frac{9}{15}$.

$\frac{5}{15}$ $\frac{9}{15}$

$\frac{9}{15}$ is greater than $\frac{5}{15}$.

So, $\frac{3}{5}$ is greater than $\frac{1}{3}$.

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Extra notes

It is easy to compare fractions with the same denominator. We only have to focus on the numerators.

The fraction is greater if its numerator is the greater number. That is because you are talking about more parts of the whole.

Lesson 2
Comparing and ordering fractions

Lesson objectives

By the end of the lesson, the students should be able to:

1. Compare fractions with different denominators.
2. Order fractions with different denominators.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Equivalent fraction

Materials needed

-

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Help the students to recall how to compare fractions which one denominator is a multiple of the other. Ask them to compare these pairs of fractions.

   $\frac{2}{3}$ $\frac{5}{6}$ $\frac{7}{12}$ $\frac{3}{4}$

2. Tell the students to always convert fractions of different denominators into equivalent fractions with similar denominator. When comparing fractions with similar denominator, we just need to compare the numerators.
3. Use the examples to explain further.

Teaching ideas

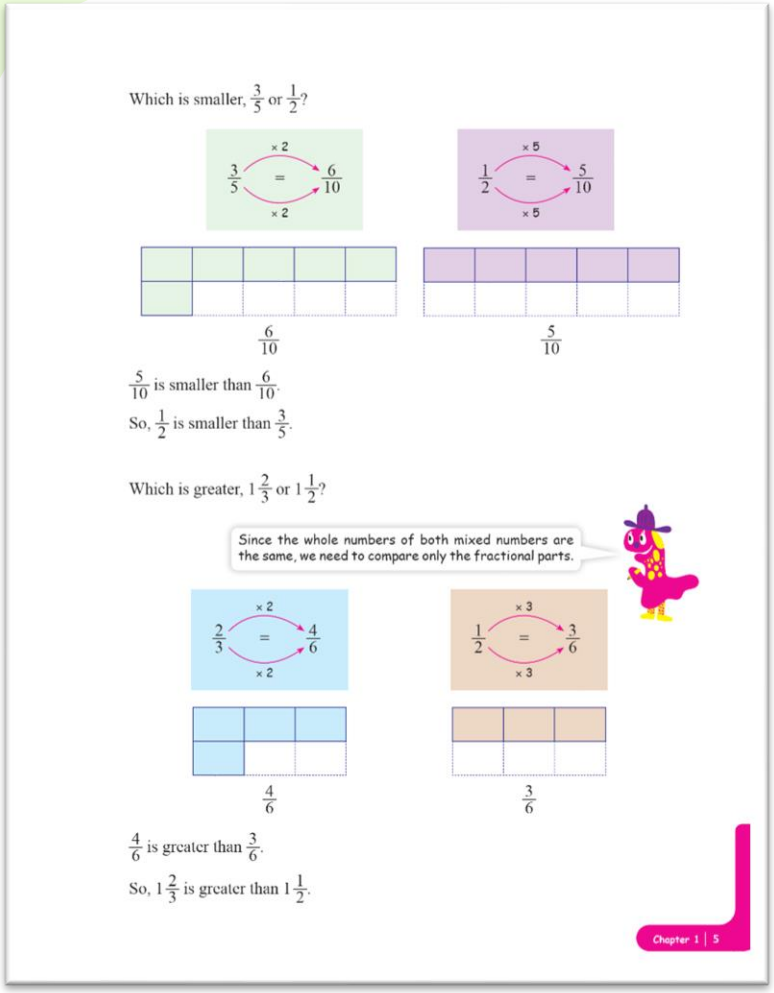
4. Tell the students that we need to find equivalent fractions with a similar denominator. We can do that by multiplying the numerator and denominator of each fraction by the denominator of the other.

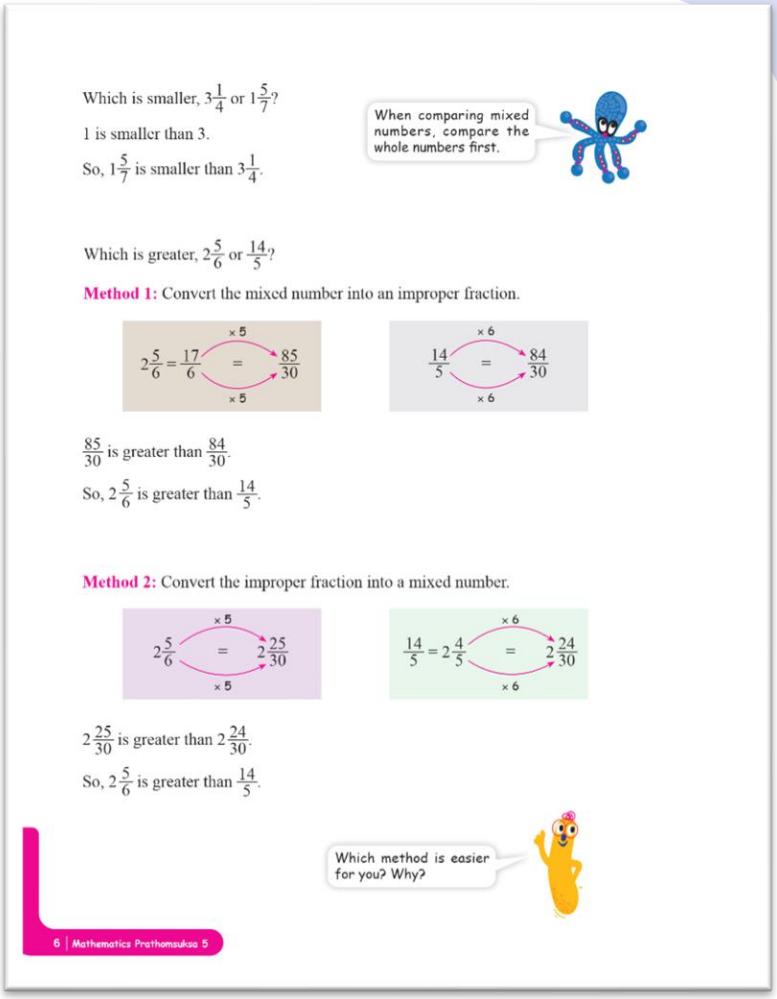
   For example, when comparing $\frac{3}{5}$ and $\frac{1}{2}$

   $\frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10}$ $\quad\quad$ $\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}$

5. When comparing mixed numbers, always ask them to compare the whole numbers first. If they are the same, then ask the students to compare the fractional parts. If the fractional parts have different denominators, convert them into equivalent fractions with a similar denominator.

6. Use the examples to explain further.





Which is smaller, $3\frac{1}{4}$ or $1\frac{5}{7}$?

1 is smaller than 3.

So, $1\frac{5}{7}$ is smaller than $3\frac{1}{4}$.

When comparing mixed numbers, compare the whole numbers first.

Which is greater, $2\frac{5}{6}$ or $\frac{14}{5}$?

Method 1: Convert the mixed number into an improper fraction.

$2\frac{5}{6} = \frac{17}{6} = \frac{85}{30}$ (×5, ×5)

$\frac{14}{5} = \frac{84}{30}$ (×6, ×6)

$\frac{85}{30}$ is greater than $\frac{84}{30}$.

So, $2\frac{5}{6}$ is greater than $\frac{14}{5}$.

Method 2: Convert the improper fraction into a mixed number.

$2\frac{5}{6} = 2\frac{25}{30}$ (×5, ×5)

$\frac{14}{5} = 2\frac{4}{5} = 2\frac{24}{30}$ (×6, ×6)

$2\frac{25}{30}$ is greater than $2\frac{24}{30}$.

So, $2\frac{5}{6}$ is greater than $\frac{14}{5}$.

Which method is easier for you? Why?

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More Info

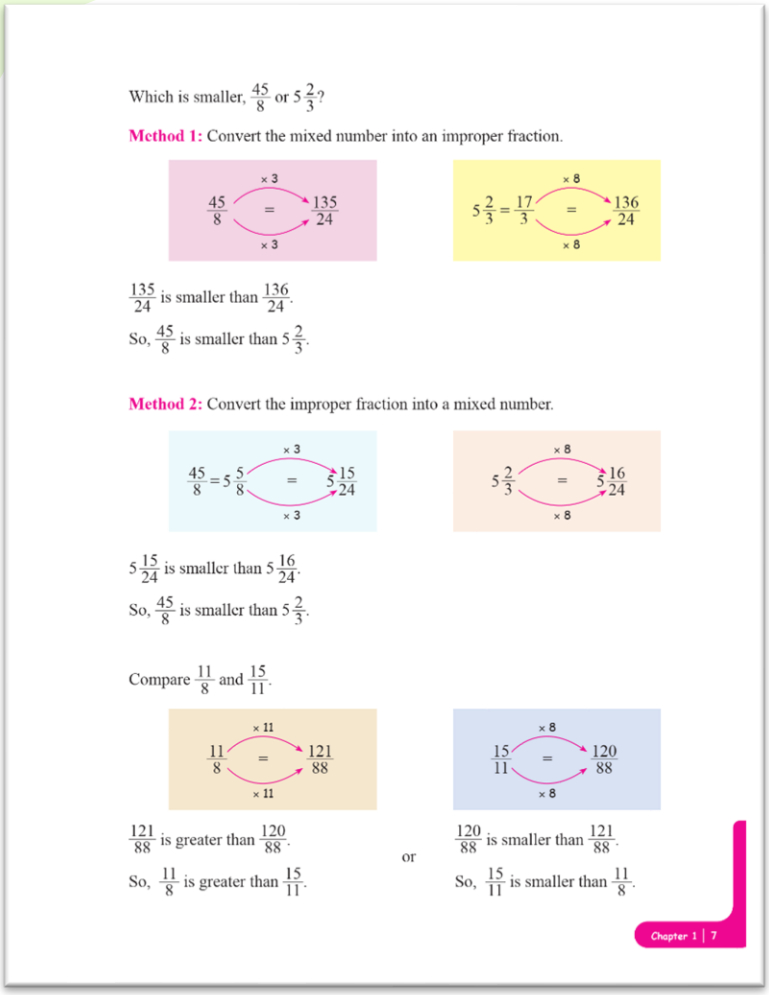
or visit
http://tiny.cc/4ynsuz

Teaching ideas

7. When comparing a mixed number and an improper fraction, they can either
   a) convert the mixed number into an improper fraction, or
   b) convert the improper fraction into a mixed number.
8. Emphasize that either method gives the similar result.
9. Use the examples to explain further.

Teaching ideas

10. When comparing 2 improper fractions with different denominators, they can convert them into equivalent fractions with a similar denominator.
11. Use the example to explain further.



Which is smaller, $\frac{45}{8}$ or $5\frac{2}{3}$?

Method 1: Convert the mixed number into an improper fraction.

$\frac{45}{8} \overset{\times 3}{=} \frac{135}{24}$ $\quad$ $5\frac{2}{3} = \frac{17}{3} \overset{\times 8}{=} \frac{136}{24}$

$\frac{135}{24}$ is smaller than $\frac{136}{24}$.

So, $\frac{45}{8}$ is smaller than $5\frac{2}{3}$.

Method 2: Convert the improper fraction into a mixed number.

$\frac{45}{8} = 5\frac{5}{8} \overset{\times 3}{=} 5\frac{15}{24}$ $\quad$ $5\frac{2}{3} \overset{\times 8}{=} 5\frac{16}{24}$

$5\frac{15}{24}$ is smaller than $5\frac{16}{24}$.

So, $\frac{45}{8}$ is smaller than $5\frac{2}{3}$.

Compare $\frac{11}{8}$ and $\frac{15}{11}$.

$\frac{11}{8} \overset{\times 11}{=} \frac{121}{88}$ $\quad$ $\frac{15}{11} \overset{\times 8}{=} \frac{120}{88}$

$\frac{121}{88}$ is greater than $\frac{120}{88}$.

So, $\frac{11}{8}$ is greater than $\frac{15}{11}$.

or

$\frac{120}{88}$ is smaller than $\frac{121}{88}$.

So, $\frac{15}{11}$ is smaller than $\frac{11}{8}$.

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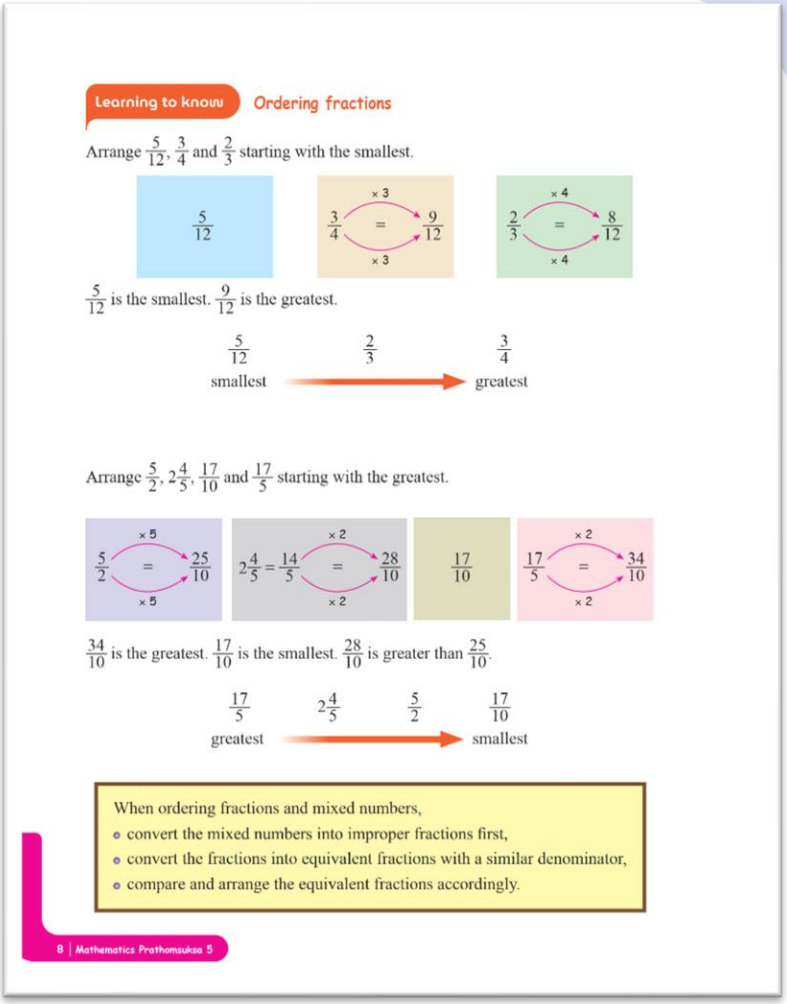

Learning to know Ordering fractions

Arrange $\frac{5}{12}$, $\frac{3}{4}$ and $\frac{2}{3}$ starting with the smallest.

$\frac{5}{12}$

$\frac{3}{4} = \frac{9}{12}$ (× 3)

$\frac{2}{3} = \frac{8}{12}$ (× 4)

$\frac{5}{12}$ is the smallest. $\frac{9}{12}$ is the greatest.

$\frac{5}{12}$ $\frac{2}{3}$ $\frac{3}{4}$

smallest → greatest

Arrange $\frac{5}{2}$, $2\frac{4}{5}$, $\frac{17}{10}$ and $\frac{17}{5}$ starting with the greatest.

$\frac{5}{2} = \frac{25}{10}$ (× 5)

$2\frac{4}{5} = \frac{14}{5} = \frac{28}{10}$ (× 2)

$\frac{17}{10}$

$\frac{17}{5} = \frac{34}{10}$ (× 2)

$\frac{34}{10}$ is the greatest. $\frac{17}{10}$ is the smallest. $\frac{28}{10}$ is greater than $\frac{25}{10}$.

$\frac{17}{5}$ $2\frac{4}{5}$ $\frac{5}{2}$ $\frac{17}{10}$

greatest → smallest

When ordering fractions and mixed numbers,
- convert the mixed numbers into improper fractions first,
- convert the fractions into equivalent fractions with a similar denominator,
- compare and arrange the equivalent fractions accordingly.

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Teaching ideas

1. When ordering fractions with different denominators, it is best to convert them into equivalent fractions with similar denominator. We can just compare and order them based on their numerators.
2. If the fractions are of different types, change them into either all mixed numbers or improper fractions.
3. Use the examples to explain further.

Teaching ideas

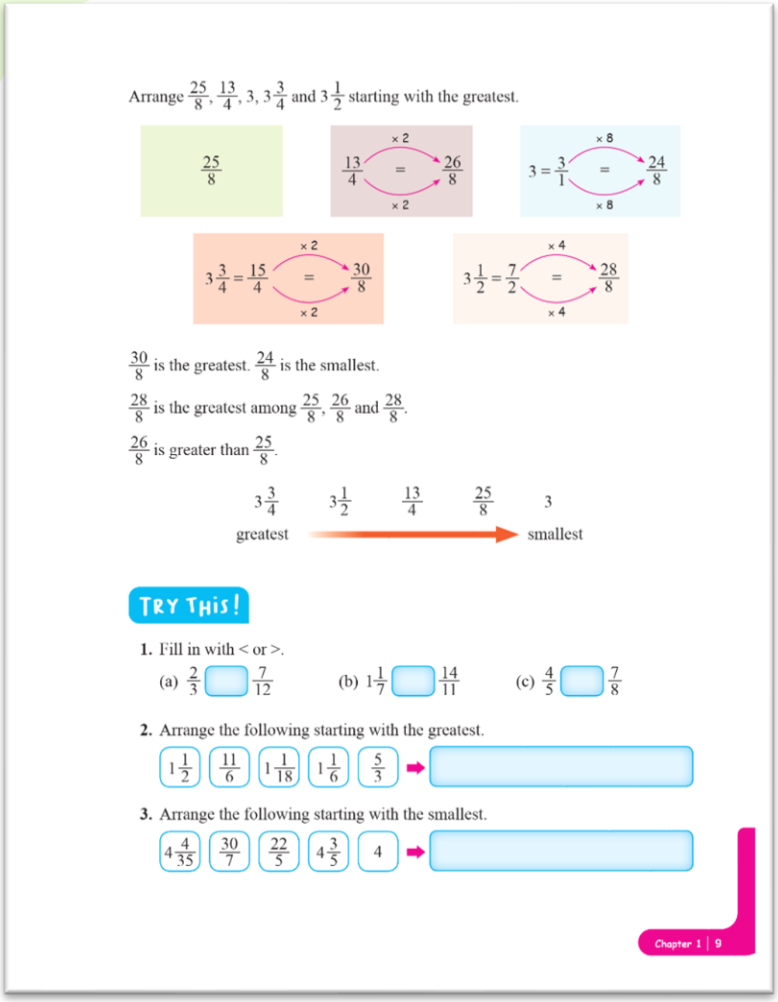
4. Use the example to explain further.
5. Guide the students to refer to **Starting Point** on page 4. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 5 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 5 to 7 in Go Get Maths Workbook P5.



Arrange $\frac{25}{8}$, $\frac{13}{4}$, 3, $3\frac{3}{4}$ and $3\frac{1}{2}$ starting with the greatest.

$\frac{25}{8}$

$\frac{13}{4} = \frac{26}{8}$ (×2)

$3 = \frac{3}{1} = \frac{24}{8}$ (×8)

$3\frac{3}{4} = \frac{15}{4} = \frac{30}{8}$ (×2)

$3\frac{1}{2} = \frac{7}{2} = \frac{28}{8}$ (×4)

$\frac{30}{8}$ is the greatest. $\frac{24}{8}$ is the smallest.

$\frac{28}{8}$ is the greatest among $\frac{25}{8}$, $\frac{26}{8}$ and $\frac{28}{8}$.

$\frac{26}{8}$ is greater than $\frac{25}{8}$.

$3\frac{3}{4}$ $3\frac{1}{2}$ $\frac{13}{4}$ $\frac{25}{8}$ 3

greatest → smallest

TRY THIS!

1. Fill in with < or >.
   (a) $\frac{2}{3}$ ☐ $\frac{7}{12}$ (b) $1\frac{1}{7}$ ☐ $\frac{14}{11}$ (c) $\frac{4}{5}$ ☐ $\frac{7}{8}$
2. Arrange the following starting with the greatest.
   $1\frac{1}{2}$ $\frac{11}{6}$ $1\frac{1}{18}$ $1\frac{1}{6}$ $\frac{5}{3}$ ➡ ☐
3. Arrange the following starting with the smallest.
   $4\frac{4}{35}$ $\frac{30}{7}$ $\frac{22}{5}$ $4\frac{3}{5}$ 4 ➡ ☐

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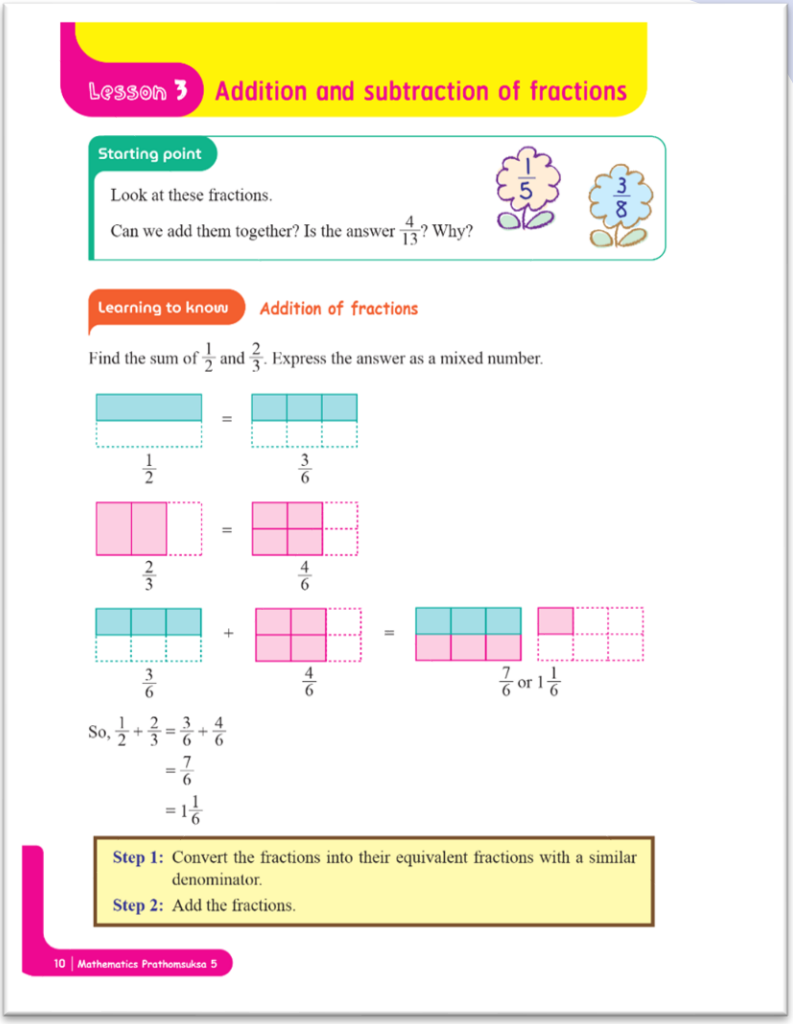

Lesson 3 Addition and subtraction of fractions

Starting point

Look at these fractions.

Can we add them together? Is the answer $\frac{4}{13}$? Why?

$\frac{1}{5}$ $\frac{3}{8}$

Learning to know Addition of fractions

Find the sum of $\frac{1}{2}$ and $\frac{2}{3}$. Express the answer as a mixed number.

$\frac{1}{2} = \frac{3}{6}$

$\frac{2}{3} = \frac{4}{6}$

$\frac{3}{6} + \frac{4}{6} = \frac{7}{6}$ or $1\frac{1}{6}$

So, $\frac{1}{2} + \frac{2}{3} = \frac{3}{6} + \frac{4}{6}$

$= \frac{7}{6}$

$= 1\frac{1}{6}$

Step 1: Convert the fractions into their equivalent fractions with a similar denominator.

Step 2: Add the fractions.

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Activity for Reinforcement

The students need to practice more in order to add correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{1}{3} + \frac{1}{2} =$ ☐

$\frac{1}{4} + \frac{5}{6} =$ ☐

$\frac{2}{3} + \frac{7}{10} =$ ☐

$\frac{4}{5} + \frac{3}{8} =$ ☐

Lesson 3 Addition and subtraction of fractions

Lesson objectives

By the end of the lesson, the students should be able to:

1. Add fractions with different denominators.
2. Subtract fractions with different denominators.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Add, subtract, equivalent fraction

Materials needed

-

Starting point

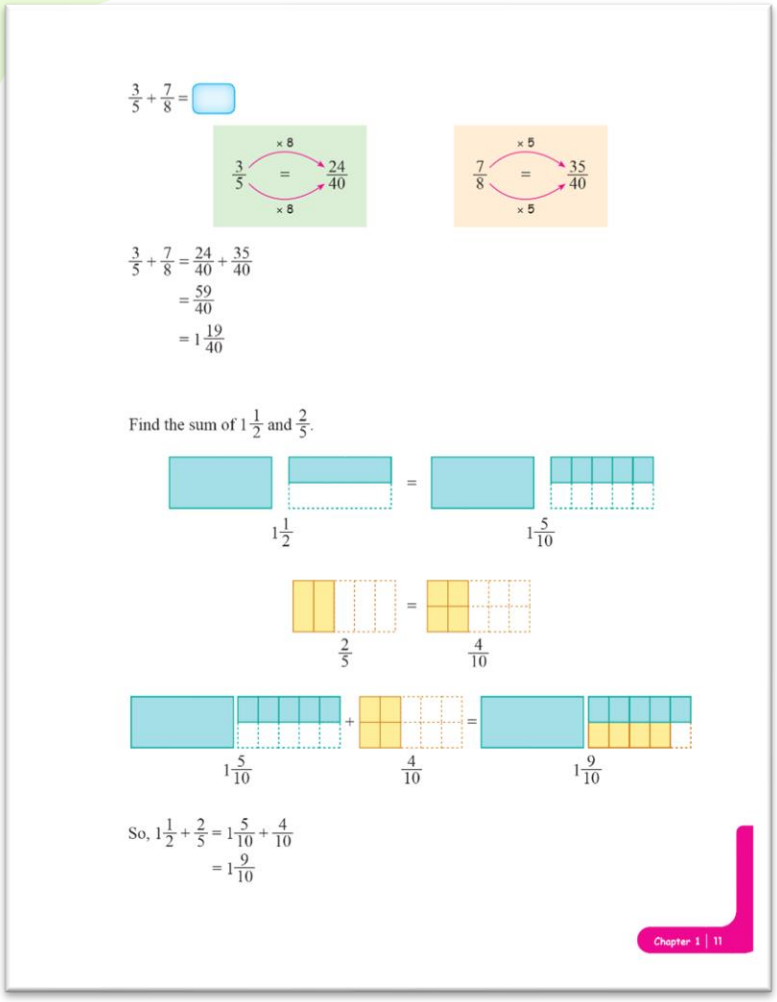
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. When adding fractions, ask the students to observe if the denominators are similar. Tell them that they can add the numerators if the denominators are the same.
2. Ask the students if they can add fractions with different denominators directly and what they should do.
3. Use the example to explain further.

Teaching ideas

4. Write $\frac{3}{5} + \frac{7}{8}$ on the board. Ask them these questions to start the discussion:
   a) Can we add them directly? Why?
   b) What should we do?
   c) What should we multiply the numerator and denominator of $\frac{3}{5}$ by?
   d) What should we multiply the numerator and denominator of $\frac{7}{8}$ by?
5. Ask the students to simplify all the results wherever possible.
6. Inform the students that for addition, we do not need to convert a mixed number into its equivalent improper fraction. This will make the addition easier.
7. Use the example to explain.



$\frac{3}{5} + \frac{7}{8} = \square$

$\frac{3}{5} \xrightarrow{\times 8} \frac{24}{40}$ $\quad \frac{7}{8} \xrightarrow{\times 5} \frac{35}{40}$

$\frac{3}{5} + \frac{7}{8} = \frac{24}{40} + \frac{35}{40}$

$= \frac{59}{40}$

$= 1\frac{19}{40}$

Find the sum of $1\frac{1}{2}$ and $\frac{2}{5}$.

$1\frac{1}{2} = 1\frac{5}{10}$

$\frac{2}{5} = \frac{4}{10}$

$1\frac{5}{10} + \frac{4}{10} = 1\frac{9}{10}$

So, $1\frac{1}{2} + \frac{2}{5} = 1\frac{5}{10} + \frac{4}{10}$

$= 1\frac{9}{10}$

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HOTS QS

or visit
http://tiny.cc/cznsuz

Activity for Reinforcement

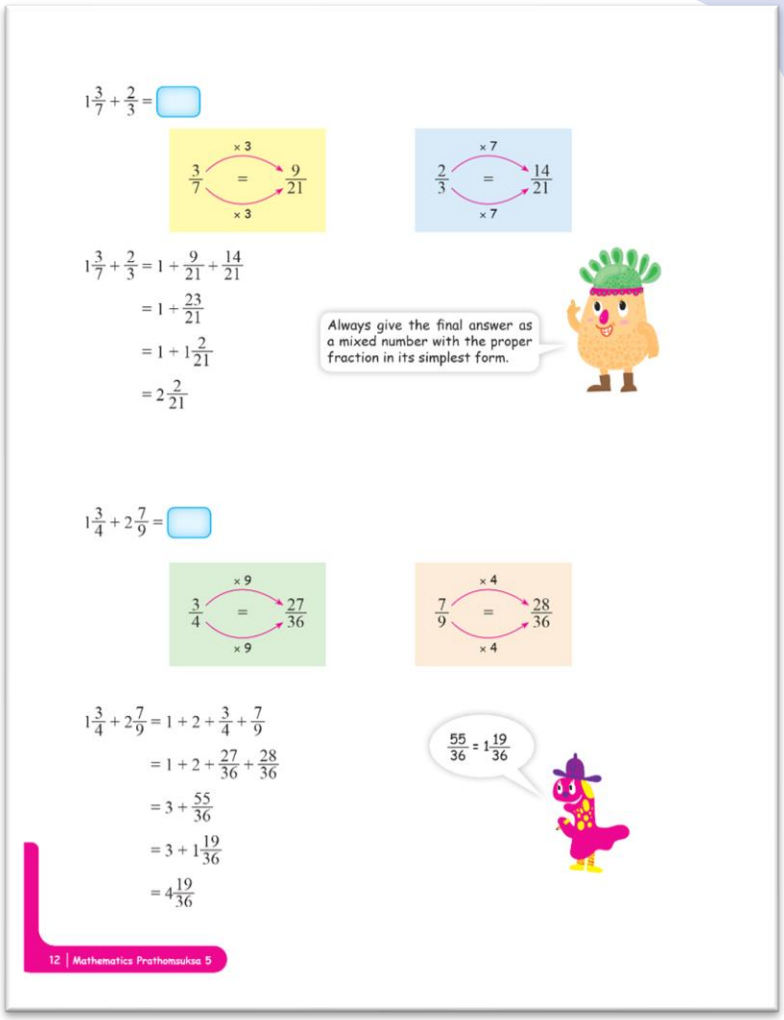
The students need to practice more in order to add correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{2}{3} + \frac{5}{2} = \square$

$\frac{3}{4} + \frac{8}{7} = \square$

$\frac{5}{2} + \frac{7}{9} = \square$

$\frac{4}{3} + \frac{13}{5} = \square$



Teaching ideas

8. Use the example to explain further.
9. Inform the students that for the addition of mixed numbers, we can add the whole numbers of the mixed numbers separately from the fractional parts.
10. Use the example to explain further.

Activity for Reinforcement

The students need to practice more in order to add correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$1\frac{1}{2}+\frac{1}{3}=$ ☐

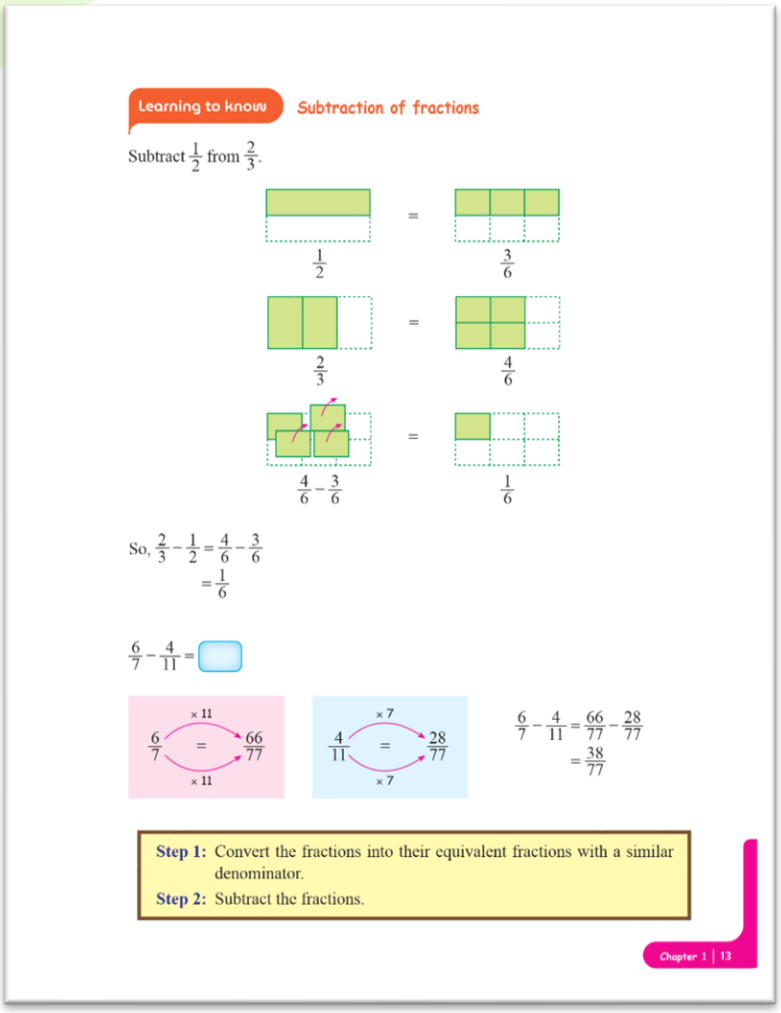
$\frac{3}{5}+2\frac{1}{4}=$ ☐

$1\frac{2}{3}+\frac{7}{8}=$ ☐

$2\frac{4}{5}+1\frac{1}{3}=$ ☐

Teaching ideas

1. Inform the students that we can only subtract fractions with similar denominators.
2. Ask the students what they should do if the denominators are not the same.
3. Use the examples to explain.



Learning to know Subtraction of fractions

Subtract $\frac{1}{2}$ from $\frac{2}{3}$.

$\frac{1}{2} = \frac{3}{6}$

$\frac{2}{3} = \frac{4}{6}$

$\frac{4}{6} - \frac{3}{6} = \frac{1}{6}$

So, $\frac{2}{3} - \frac{1}{2} = \frac{4}{6} - \frac{3}{6}$

$= \frac{1}{6}$

$\frac{6}{7} - \frac{4}{11} =$ ☐

$\frac{6}{7} \xrightarrow{\times 11} \frac{66}{77}$ (both $\times 11$)

$\frac{4}{11} \xrightarrow{\times 7} \frac{28}{77}$ (both $\times 7$)

$\frac{6}{7} - \frac{4}{11} = \frac{66}{77} - \frac{28}{77}$

$= \frac{38}{77}$

Step 1: Convert the fractions into their equivalent fractions with a similar denominator.

Step 2: Subtract the fractions.

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Activity for Reinforcement

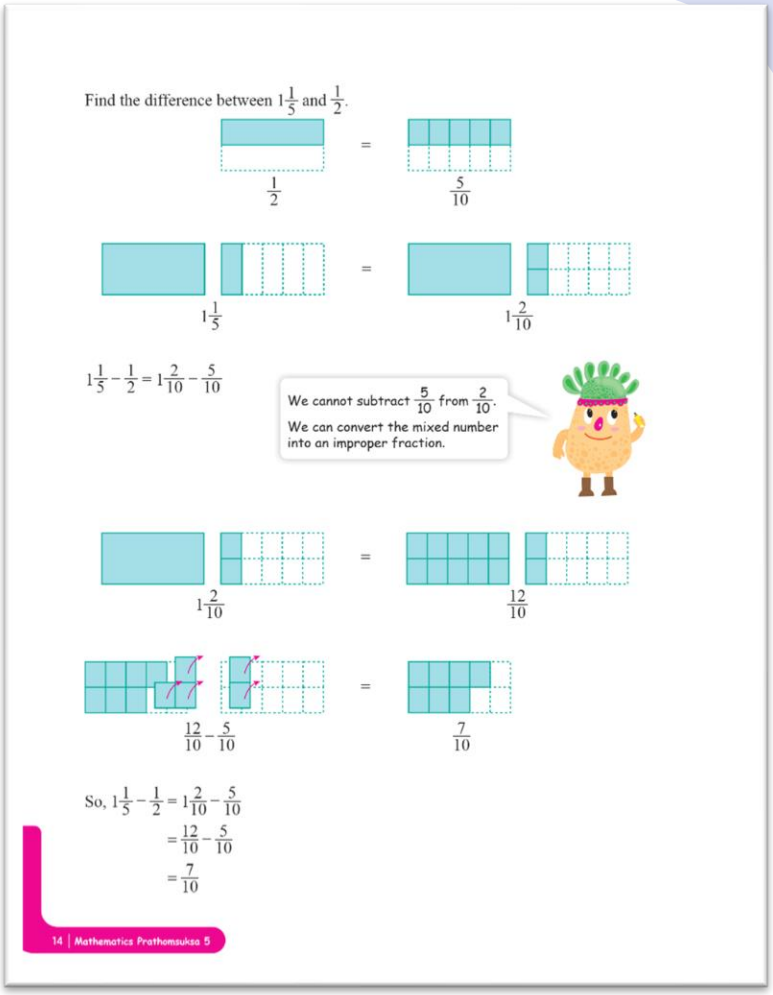
The students need to practice more in order to subtract correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{2}{3} - \frac{1}{4} =$ ☐

$\frac{3}{4} - \frac{2}{5} =$ ☐

$\frac{5}{6} - \frac{3}{8} =$ ☐

$\frac{7}{9} - \frac{3}{7} =$ ☐



Activity for Reinforcement

The students need to practice more in order to subtract correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$1\frac{1}{3} - \frac{1}{4} =$ ☐

$2\frac{4}{5} - \frac{1}{2} =$ ☐

$3\frac{1}{6} - \frac{3}{8} =$ ☐

$1\frac{2}{7} - \frac{2}{3} =$ ☐

Teaching ideas

4. Write $1\frac{1}{5} - \frac{1}{2}$ on the board. Ask them these questions to start a discussion:
   a) Are the denominators the same?
   b) What should we do?
   c) What should we multiply the numerator and denominator of $\frac{1}{5}$ by?
   d) What should we multiply the numerator and denominator of $\frac{1}{2}$ by?
   e) Can we subtract $\frac{5}{10}$ from $\frac{2}{10}$? What should we do?
5. Guide them to understand that they need to convert $1\frac{2}{10}$ into its equivalent improper fraction first.
6. Remind the students to simplify their answers whenever possible.

Teaching ideas

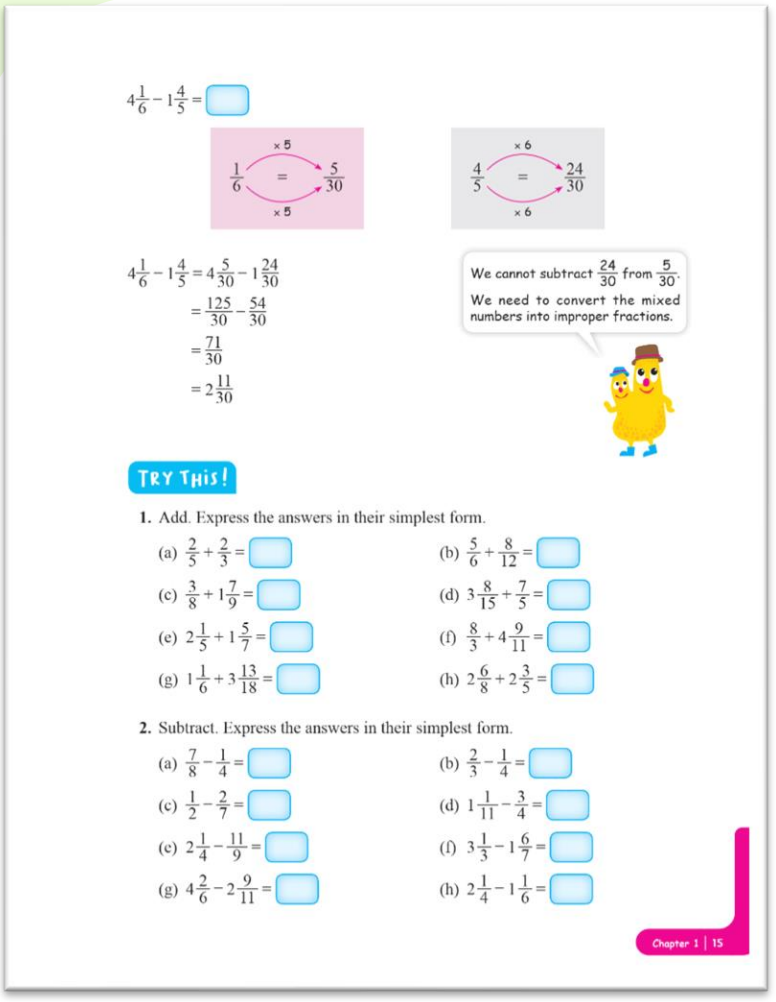
7. Use the example to explain.
8. Guide the students to refer to **Starting Point** on page 10. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 16 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 8 and 9 in Go Get Maths Workbook P5.



$4\frac{1}{6} - 1\frac{4}{5} = \square$

$\frac{1}{6} = \frac{5}{30}$ (×5)

$\frac{4}{5} = \frac{24}{30}$ (×6)

$4\frac{1}{6} - 1\frac{4}{5} = 4\frac{5}{30} - 1\frac{24}{30}$

$= \frac{125}{30} - \frac{54}{30}$

$= \frac{71}{30}$

$= 2\frac{11}{30}$

We cannot subtract $\frac{24}{30}$ from $\frac{5}{30}$.
We need to convert the mixed numbers into improper fractions.

TRY THIS!

1. Add. Express the answers in their simplest form.

(a) $\frac{2}{5} + \frac{2}{3} = \square$
(b) $\frac{5}{6} + \frac{8}{12} = \square$
(c) $\frac{3}{8} + 1\frac{7}{9} = \square$
(d) $3\frac{8}{15} + \frac{7}{5} = \square$
(e) $2\frac{1}{5} + 1\frac{5}{7} = \square$
(f) $\frac{8}{3} + 4\frac{9}{11} = \square$
(g) $1\frac{1}{6} + 3\frac{13}{18} = \square$
(h) $2\frac{6}{8} + 2\frac{3}{5} = \square$

2. Subtract. Express the answers in their simplest form.

(a) $\frac{7}{8} - \frac{1}{4} = \square$
(b) $\frac{2}{3} - \frac{1}{4} = \square$
(c) $\frac{1}{2} - \frac{2}{7} = \square$
(d) $1\frac{1}{11} - \frac{3}{4} = \square$
(e) $2\frac{1}{4} - \frac{11}{9} = \square$
(f) $3\frac{1}{3} - 1\frac{6}{7} = \square$
(g) $4\frac{2}{6} - 2\frac{9}{11} = \square$
(h) $2\frac{1}{4} - 1\frac{1}{6} = \square$

Chapter 1 | 15

More Tasks

or visit
https://wordwall.net/play/33636/104/337

Activity for Reinforcement

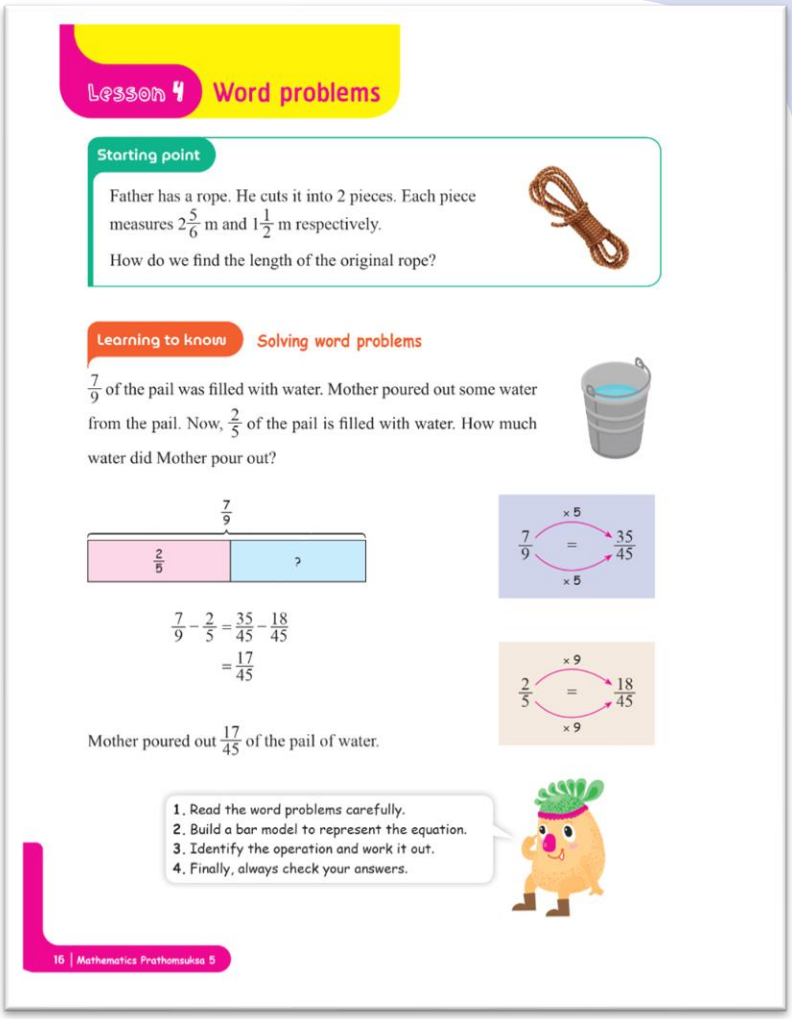
The students need to practice more in order to subtract correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$2\frac{1}{3} - 1\frac{1}{4} = \square$

$4\frac{1}{6} - 1\frac{2}{5} = \square$

$3\frac{5}{7} - 2\frac{7}{8} = \square$

$5\frac{1}{8} - 2\frac{2}{3} = \square$



Lesson 4 Word problems

Starting point

Father has a rope. He cuts it into 2 pieces. Each piece measures $2\frac{5}{6}$ m and $1\frac{1}{2}$ m respectively.

How do we find the length of the original rope?

Learning to know Solving word problems

$\frac{7}{9}$ of the pail was filled with water. Mother poured out some water from the pail. Now, $\frac{2}{5}$ of the pail is filled with water. How much water did Mother pour out?

$\frac{7}{9}$

$\frac{2}{5}$?

$\frac{7}{9} - \frac{2}{5} = \frac{35}{45} - \frac{18}{45}$

$= \frac{17}{45}$

$\frac{7}{9} \xrightarrow{\times 5} \frac{35}{45}$

$\frac{2}{5} \xrightarrow{\times 9} \frac{18}{45}$

Mother poured out $\frac{17}{45}$ of the pail of water.

1. Read the word problems carefully.
2. Build a bar model to represent the equation.
3. Identify the operation and work it out.
4. Finally, always check your answers.

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Lesson 4
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving fractions with different denominators.
2. Solve 2-step word problems with fractions with different denominators.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Reiterate the 3 simple steps to solve a word problem.

   Step 1: Understand the problem

   - Ask the students to read the number story and the question silently. Then, read them together with the students. Explain further the number story and the question if the students do not understand.
   - Ask the students these questions to ensure they understand:
     - What information is given?
     - What do you need to find?
     - Are you comparing the items?

Teaching ideas

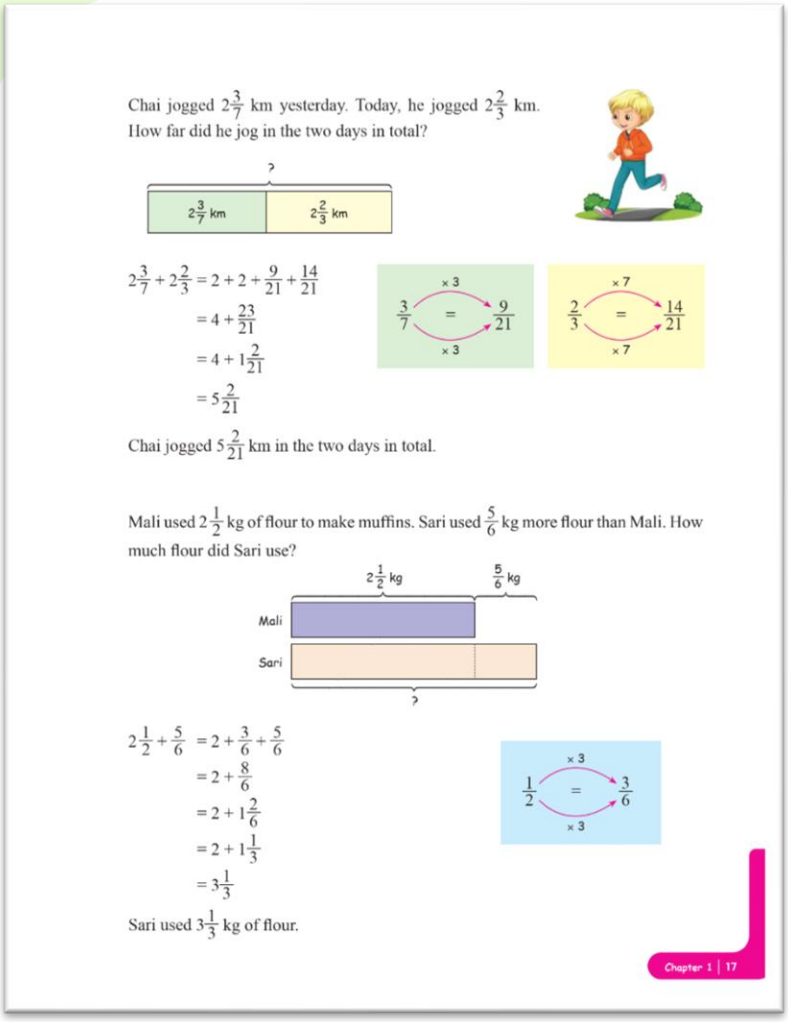
Step 2: Plan and execute

- Ask the students to draw the suitable bar model including the knowns and unknowns.
- Ask them to find the keyword in the problem that indicates the operation whether to add, to subtract, to multiply or to divide.
- Analyze the bar model drawn.
- Then, write the number equation and solve it.

Step 3: Check the answer

- Always ask the students to check their answer. They need to check if the answer makes sense and is reasonable.

2. Work with them the 3 steps in solving the word problems.



Chai jogged $2\frac{3}{7}$ km yesterday. Today, he jogged $2\frac{2}{3}$ km. How far did he jog in the two days in total?

$2\frac{3}{7} + 2\frac{2}{3} = 2 + 2 + \frac{9}{21} + \frac{14}{21}$
$= 4 + \frac{23}{21}$
$= 4 + 1\frac{2}{21}$
$= 5\frac{2}{21}$

Chai jogged $5\frac{2}{21}$ km in the two days in total.

Mali used $2\frac{1}{2}$ kg of flour to make muffins. Sari used $\frac{5}{6}$ kg more flour than Mali. How much flour did Sari use?

$2\frac{1}{2} + \frac{5}{6} = 2 + \frac{3}{6} + \frac{5}{6}$
$= 2 + \frac{8}{6}$
$= 2 + 1\frac{2}{6}$
$= 2 + 1\frac{1}{3}$
$= 3\frac{1}{3}$

Sari used $3\frac{1}{3}$ kg of flour.

Chapter 1 | 17

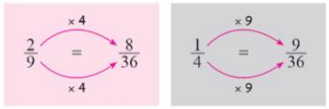
Kim had a piece of string. He used $\frac{2}{9}$ of it to tie some books. Then, he used $\frac{1}{4}$ of the string to tie a box. What fraction of the string was left?

The first step

He used $\frac{2}{9}$ of it to tie some books. Then, he used $\frac{1}{4}$ of the string to tie a box. What fraction of the string did he use?

$\frac{2}{9} + \frac{1}{4} = \frac{8}{36} + \frac{9}{36}$

$= \frac{17}{36}$



He used $\frac{17}{36}$ of the string.

The second step

Kim had a piece of string. He used $\frac{17}{36}$ of it. What fraction of the string was left?

$1 - \frac{17}{36} = \frac{36}{36} - \frac{17}{36}$

$= \frac{19}{36}$

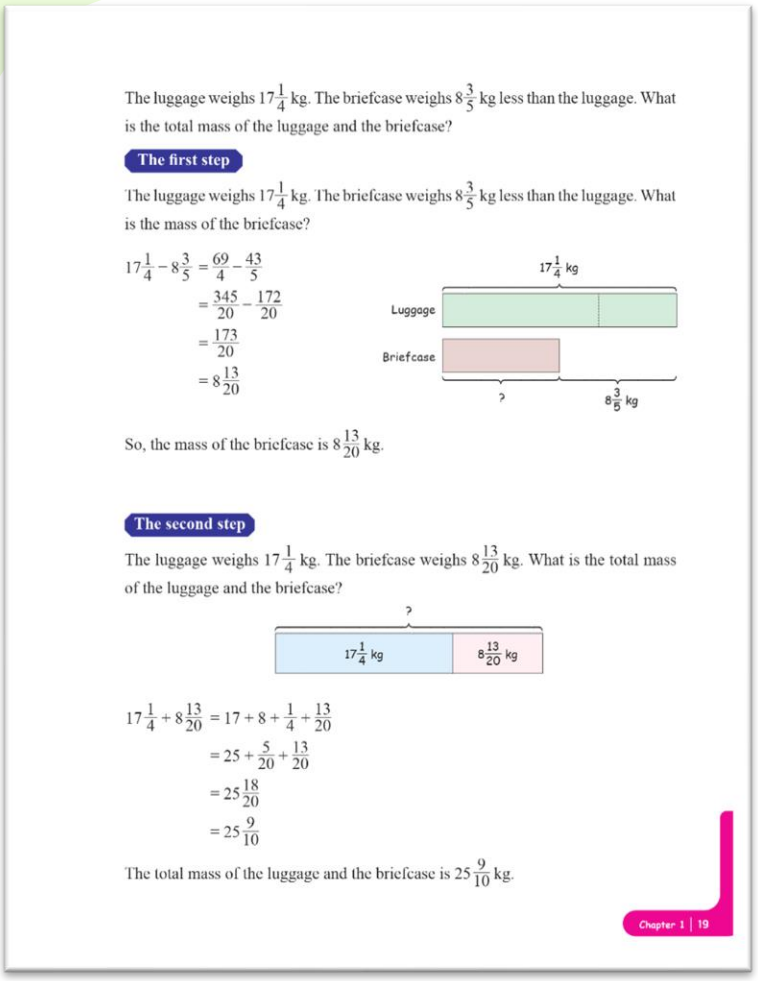
$\frac{19}{36}$ of the string was left.

Teaching ideas

3. For this example, guide the students to use the 3 steps. Set them thinking about these questions:
   a) What do I know?
      - The fraction of the string that is used to tie some books
      - The fraction of the string that is used to tie a box
   b) What do I need to find at the end?
      - The fraction of the string that was left
   c) What do I need to find out first?
      - The fraction of the string that was used

Teaching ideas

4. For this example, guide the students to use the 3 steps. Set them thinking about these questions:
   a) What do I know?
      - The mass of the luggage
      - The difference in mass between the luggage and briefcase
   b) What do I need to find at the end?
      - The total mass of the luggage and briefcase
   c) What do I need to find out first?
      - The mass of the briefcase
5. Guide the students to refer to **Starting Point** on page 16. Ask them to answer the question. Have a discussion to conclude the lesson.



The luggage weighs $17\frac{1}{4}$ kg. The briefcase weighs $8\frac{3}{5}$ kg less than the luggage. What is the total mass of the luggage and the briefcase?

The first step

The luggage weighs $17\frac{1}{4}$ kg. The briefcase weighs $8\frac{3}{5}$ kg less than the luggage. What is the mass of the briefcase?

$$17\frac{1}{4} - 8\frac{3}{5} = \frac{69}{4} - \frac{43}{5}$$
$$= \frac{345}{20} - \frac{172}{20}$$
$$= \frac{173}{20}$$
$$= 8\frac{13}{20}$$

So, the mass of the briefcase is $8\frac{13}{20}$ kg.

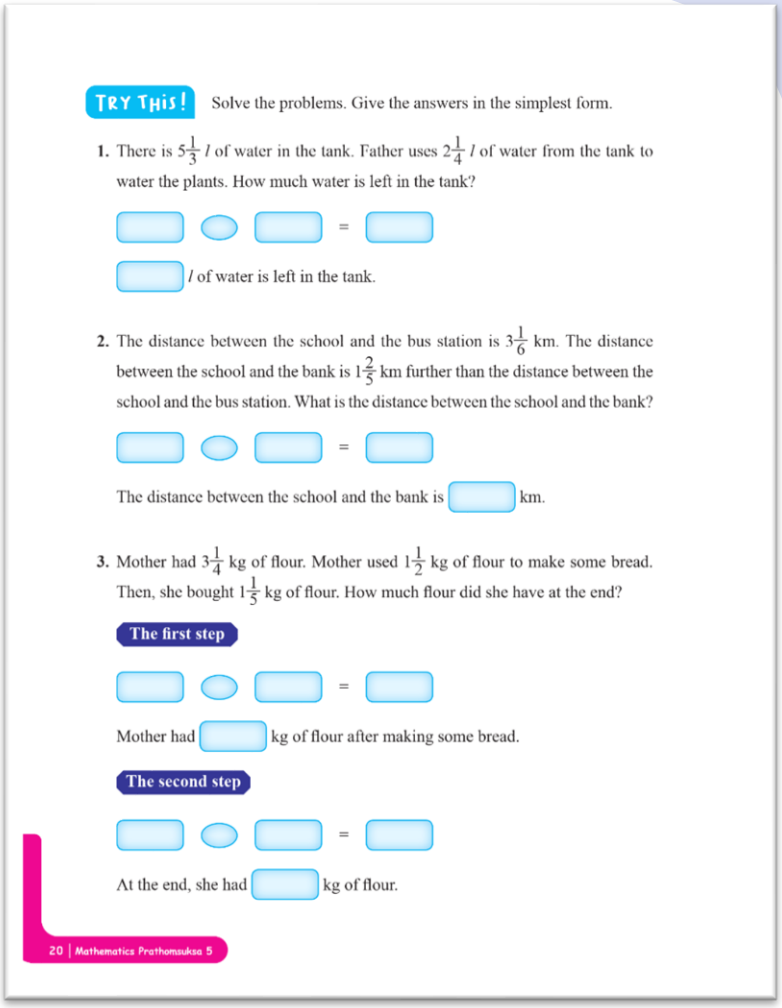
The second step

The luggage weighs $17\frac{1}{4}$ kg. The briefcase weighs $8\frac{13}{20}$ kg. What is the total mass of the luggage and the briefcase?

$$17\frac{1}{4} + 8\frac{13}{20} = 17 + 8 + \frac{1}{4} + \frac{13}{20}$$
$$= 25 + \frac{5}{20} + \frac{13}{20}$$
$$= 25\frac{18}{20}$$
$$= 25\frac{9}{10}$$

The total mass of the luggage and the briefcase is $25\frac{9}{10}$ kg.

Chapter 1 | 19



TRY THIS! Solve the problems. Give the answers in the simplest form.

1. There is $5\frac{1}{3}$ *l* of water in the tank. Father uses $2\frac{1}{4}$ *l* of water from the tank to water the plants. How much water is left in the tank?

[ ] ○ [ ] = [ ]

[ ] *l* of water is left in the tank.

2. The distance between the school and the bus station is $3\frac{1}{6}$ km. The distance between the school and the bank is $1\frac{2}{5}$ km further than the distance between the school and the bus station. What is the distance between the school and the bank?

[ ] ○ [ ] = [ ]

The distance between the school and the bank is [ ] km.

3. Mother had $3\frac{1}{4}$ kg of flour. Mother used $1\frac{1}{2}$ kg of flour to make some bread. Then, she bought $1\frac{1}{5}$ kg of flour. How much flour did she have at the end?

The first step

[ ] ○ [ ] = [ ]

Mother had [ ] kg of flour after making some bread.

The second step

[ ] ○ [ ] = [ ]

At the end, she had [ ] kg of flour.

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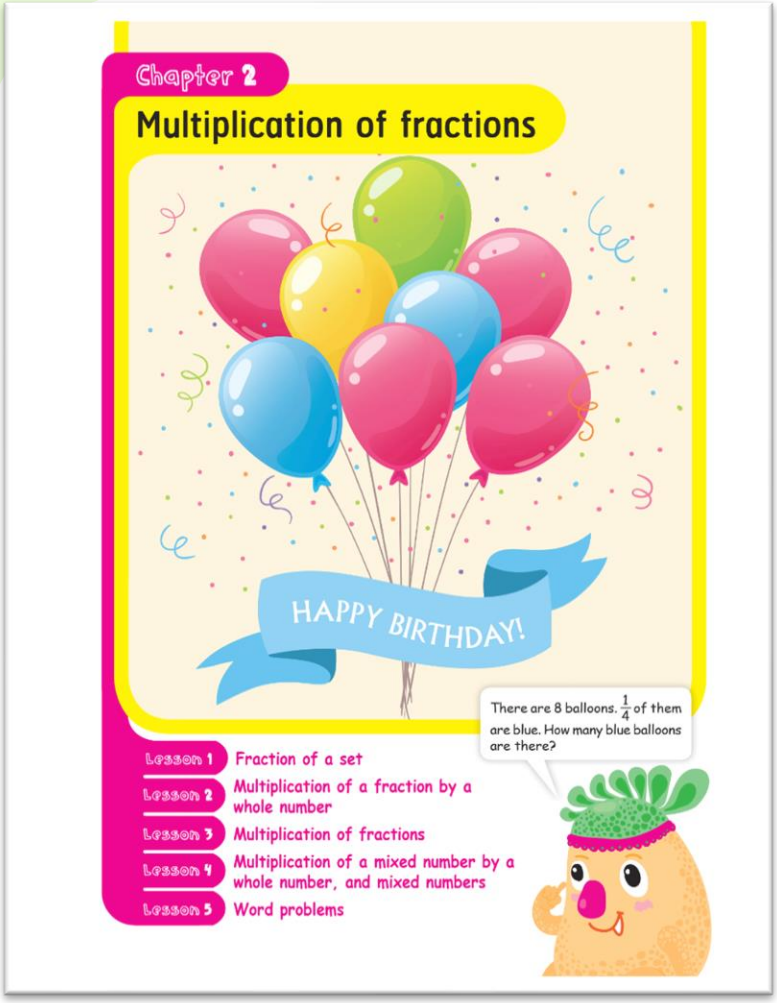
Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 10 to 16 in Go Get Maths Workbook P5.

Chapter 2
Multiplication of fractions



The big idea

Ask the students to analyze the picture and ask them these questions to start a discussion:

a) How many balloons are there?

b) How many blue balloons are there?

c) How do we find the fraction of the balloons which are blue?

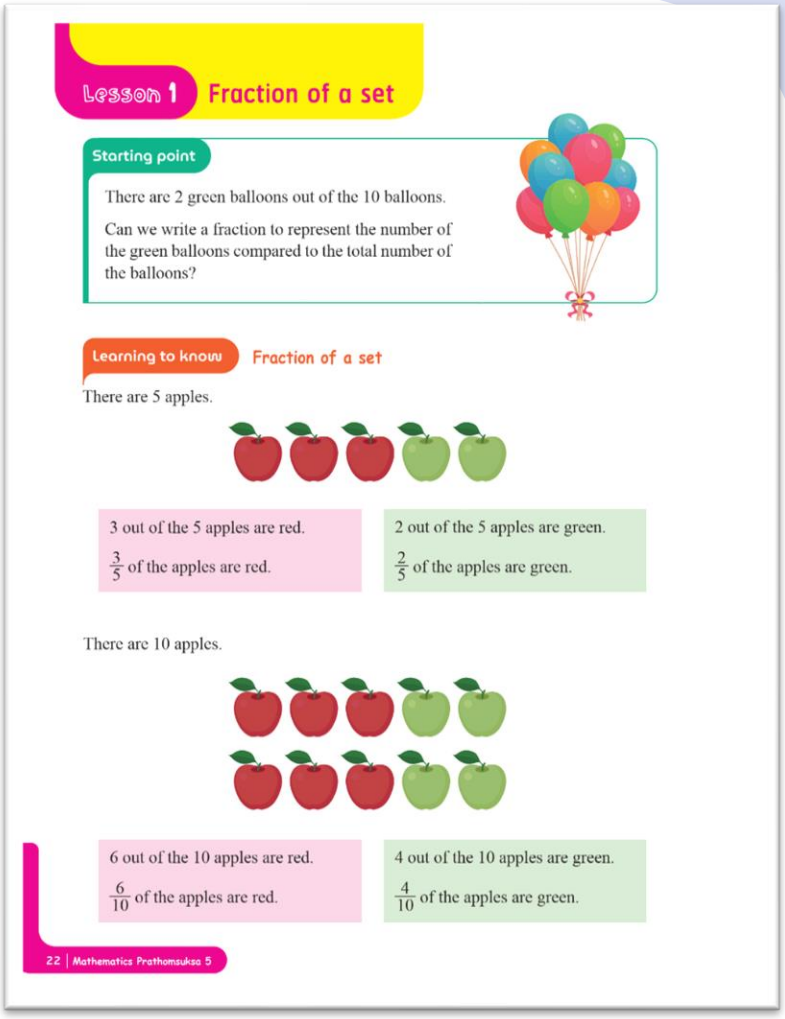
d) How do we find the number of blue balloons if we know that $\frac{1}{4}$ of the 8 balloons are blue?

Strand 1: Numbers and Algebra
Standard M.1.1 Numbers

Indicators:

M 1.1 Gr5/4 Find the results of multiplying and dividing fractions and mixed numbers.

M 1.1 Gr5/5 Show mathematical methods of finding answers of 2- step word problems of addition, subtraction, multiplication and division.



Lesson 1 Fraction of a set

Starting point

There are 2 green balloons out of the 10 balloons.

Can we write a fraction to represent the number of the green balloons compared to the total number of the balloons?

Learning to know Fraction of a set

There are 5 apples.

3 out of the 5 apples are red.

$\frac{3}{5}$ of the apples are red.

2 out of the 5 apples are green.

$\frac{2}{5}$ of the apples are green.

There are 10 apples.

6 out of the 10 apples are red.

$\frac{6}{10}$ of the apples are red.

4 out of the 10 apples are green.

$\frac{4}{10}$ of the apples are green.

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Lesson 1
Fraction of a set

Lesson objectives

By the end of the lesson, the students should be able to:

1. Understand fraction as part of a set of things.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Set, fraction

Materials needed

Linking cubes

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Guide the students to understand the first example, highlighting that the total number of apples (whole) is 5, of which 3 are red. So, 3 out of 5 is $\frac{3}{5}$.
2. Repeat with the next example. Use linking cubes to represent the apples for better understanding.

Teaching ideas

3. Repeat with the next example. Use the linking cubes to represent the balls for better understanding.
4. Remind the students that the denominator of a fraction represents the total number of objects (whole).
5. Guide the students to refer to **Starting Point** on page 22. Ask them to answer the question. Have a discussion to conclude the lesson.

Thinking Corner!

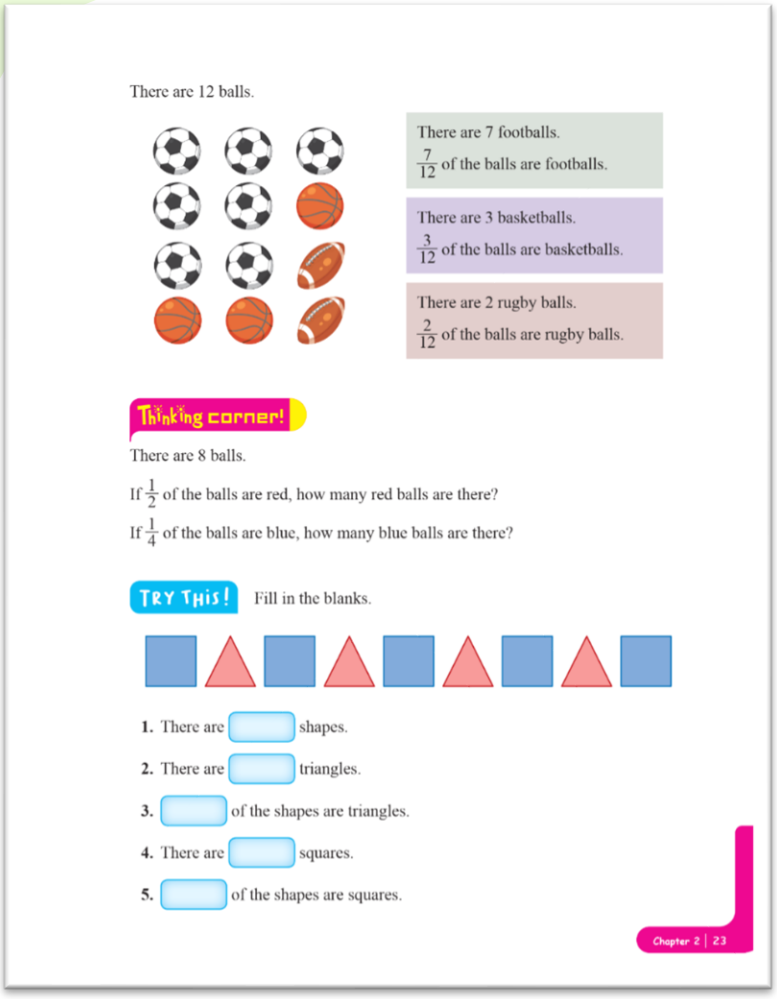
1. Get the students in groups of 5.
2. Give 8 linking cubes to each group.
3. Ask them to divide the cubes into 2 equal groups. Ask them these questions:
   a) How many cubes are there in each group?
   b) How much is $\frac{1}{2}$ of 8?
   c) What is the answer for the first question in the book?
4. Then, ask them to divide the 8 cubes into 4 equal groups. Ask them these questions:
   a) How many cubes are there in each group?
   b) How much is $\frac{1}{4}$ of 8?
   c) What is the answer for the second question in the book?

Try This!

Get 5 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 17 and 18 in Go Get Maths Workbook P5.



There are 12 balls.

There are 7 footballs.
$\frac{7}{12}$ of the balls are footballs.

There are 3 basketballs.
$\frac{3}{12}$ of the balls are basketballs.

There are 2 rugby balls.
$\frac{2}{12}$ of the balls are rugby balls.

Thinking corner!

There are 8 balls.

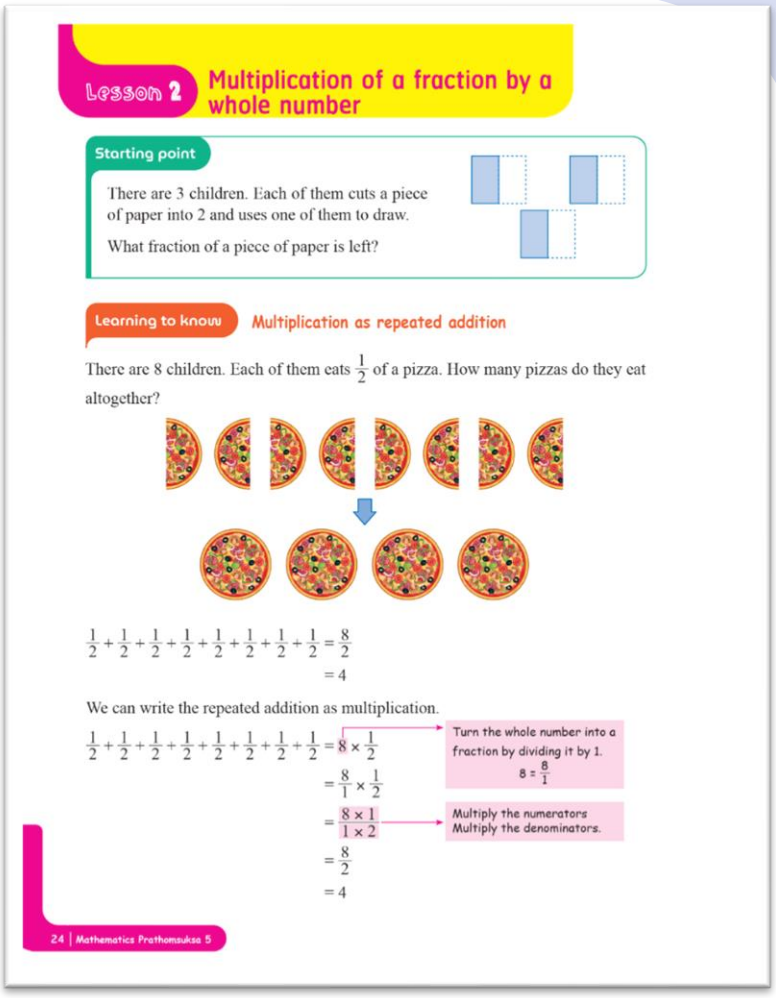
If $\frac{1}{2}$ of the balls are red, how many red balls are there?

If $\frac{1}{4}$ of the balls are blue, how many blue balls are there?

TRY THIS! Fill in the blanks.

1. There are ____ shapes.
2. There are ____ triangles.
3. ____ of the shapes are triangles.
4. There are ____ squares.
5. ____ of the shapes are squares.

Chapter 2 | 23



Lesson 2 Multiplication of a fraction by a whole number

Starting point

There are 3 children. Each of them cuts a piece of paper into 2 and uses one of them to draw.

What fraction of a piece of paper is left?

Learning to know — Multiplication as repeated addition

There are 8 children. Each of them eats $\frac{1}{2}$ of a pizza. How many pizzas do they eat altogether?

$\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=\frac{8}{2}$

$=4$

We can write the repeated addition as multiplication.

$\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=8\times\frac{1}{2}$

Turn the whole number into a fraction by dividing it by 1. $8=\frac{8}{1}$

$=\frac{8}{1}\times\frac{1}{2}$

$=\frac{8\times1}{1\times2}$

Multiply the numerators. Multiply the denominators.

$=\frac{8}{2}$

$=4$

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Activity for Reinforcement

Materials required: Pictures of a half-cut pizza

Objective of the activity: Recalling multiplication as repeated addition even for fractions

1. Ask the students to work in pairs.
2. Give them 4 pictures of a half-cut pizza and ask them how many whole pizzas do they get.
3. Tell them that $\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=2$.
4. Ask them to write the addition as multiplication
5. Repeat with 6, 8 and 10 pictures of half-cut pizzas.

Lesson 2 Multiplication of a fraction by a whole number

Lesson objectives

By the end of the lesson, the students should be able to:

1. Understand multiplication as repeated addition.
2. Multiply a fraction by a whole number.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Multiplication

Materials needed

Pictures of a half-cut pizza, linking cubes

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Help the students to recall that multiplication is repeated addition with this example:

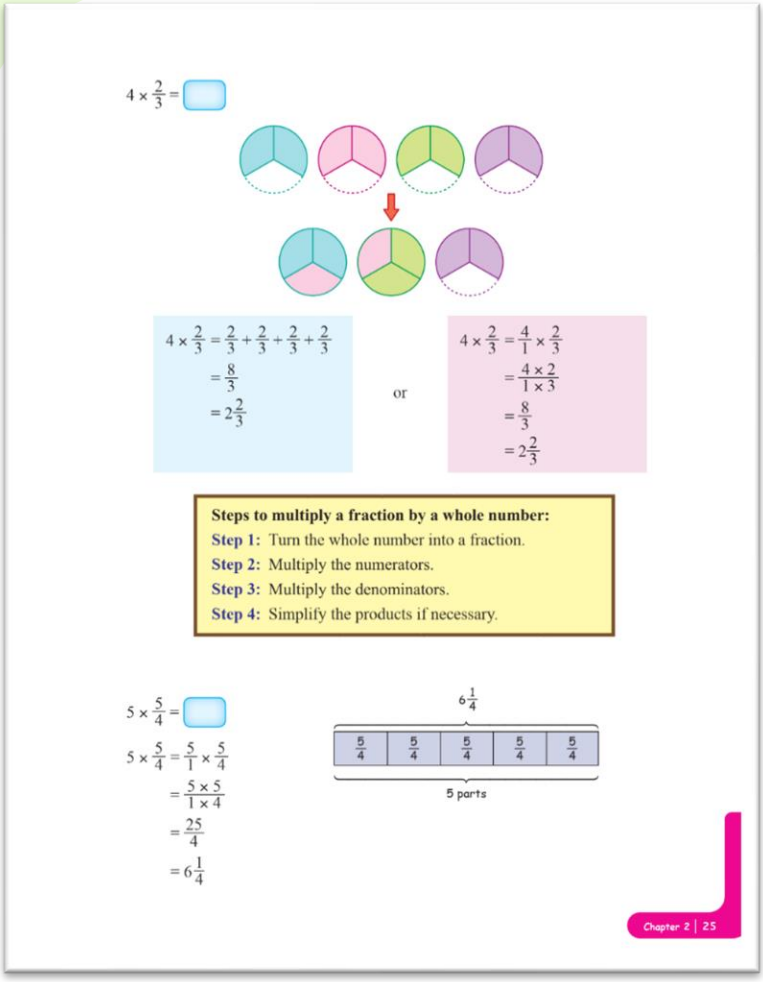
   2 + 2 + 2 = 6
   3 groups of 2 is 6.
   3 x 2 = 6

2. Use the example to explain that for multiplication of fractions is repeated addition too.

   $\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=4$
   8 groups of $\frac{1}{2}$ is 4.
   $8\times\frac{1}{2}=4$

Teaching ideas

3. Remind the students that when we multiply a fraction by a whole number, turn the whole number into an improper fraction. Then, multiply the 2 numerators and also the 2 denominators.
4. Remind them to simplify the fractions whenever possible.
5. Use the examples to explain further.



Activity for Reinforcement

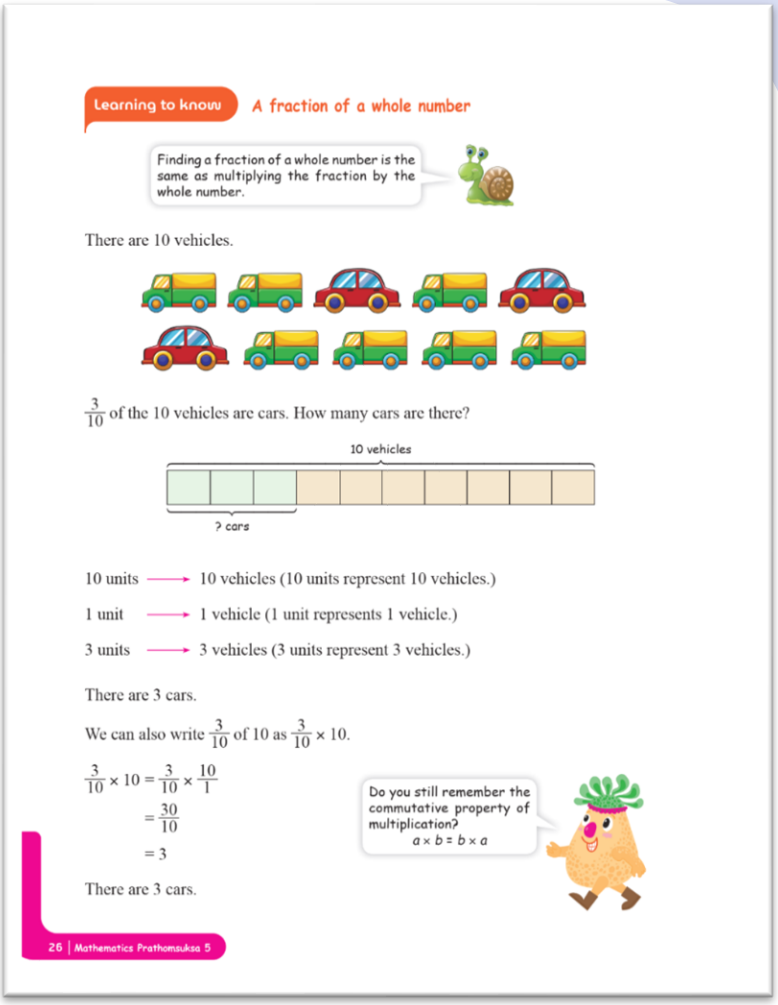
The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$2 \times \frac{1}{4} = \square$

$5 \times \frac{5}{8} = \square$

$\frac{1}{6} \times 2 = \square$

$3 \times \frac{3}{7} = \square$



Learning to know A fraction of a whole number

Finding a fraction of a whole number is the same as multiplying the fraction by the whole number.

There are 10 vehicles.

$\frac{3}{10}$ of the 10 vehicles are cars. How many cars are there?

10 vehicles

? cars

10 units → 10 vehicles (10 units represent 10 vehicles.)

1 unit → 1 vehicle (1 unit represents 1 vehicle.)

3 units → 3 vehicles (3 units represent 3 vehicles.)

There are 3 cars.

We can also write $\frac{3}{10}$ of 10 as $\frac{3}{10} \times 10$.

$\frac{3}{10} \times 10 = \frac{3}{10} \times \frac{10}{1}$

$= \frac{30}{10}$

$= 3$

There are 3 cars.

Do you still remember the commutative property of multiplication?

$a \times b = b \times a$

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Teaching ideas

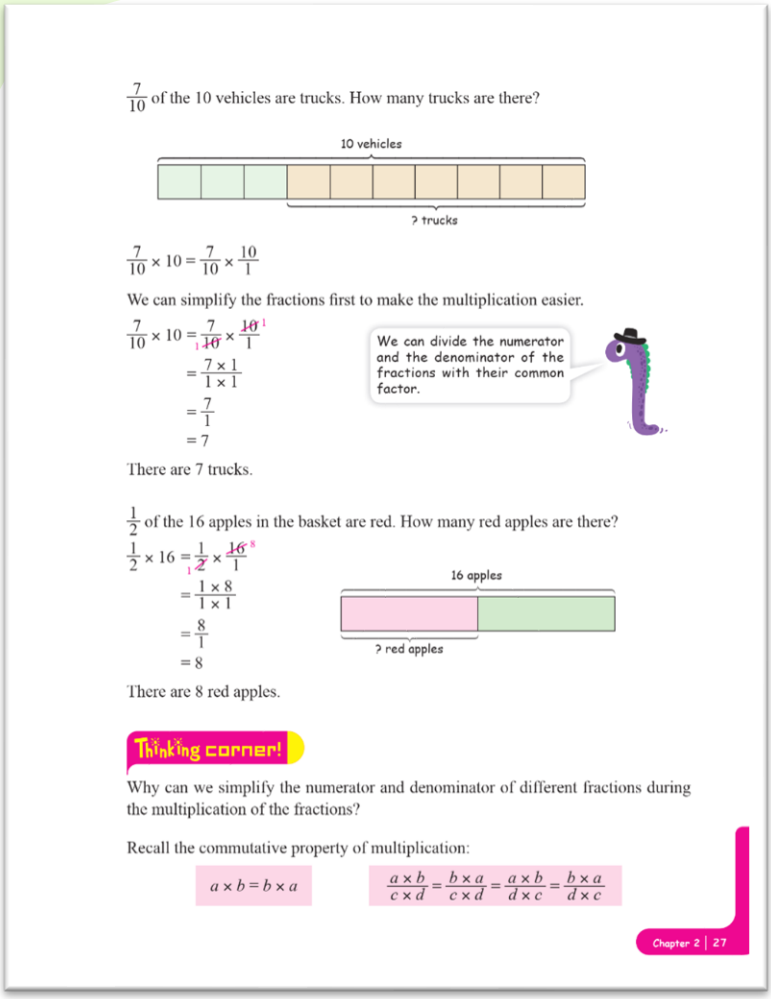
1. Get the students into groups of 5. Give each group 10 linking cubes. Guide the students to find $\frac{3}{10}$ of 10 cubes. Each cube represents 1 vehicle. So, $\frac{3}{10}$ of the 10 vehicles is 3 vehicles.
2. Guide them to realize that we can use the rule of three and also multiply $\frac{3}{10}$ by 10 to get the answer.

Teaching ideas

3. Repeat with the linking cubes to find $\frac{7}{10}$ of 10 vehicles. Each cube represents 1 vehicle. So, $\frac{7}{10}$ of the 10 vehicles is 7 vehicles.
4. Guide them to multiply $\frac{7}{10}$ by 10 to get the answer. Tell them that we can simplify a multiplication of fractions by dividing any numerator and denominator with a common factor.
5. Repeat with the linking cubes to find $\frac{1}{2}$ of 16. Guide them to divide the cubes into 2 equal groups. Ask them how many cubes there are in each group. So, $\frac{1}{2}$ of the 16 is 8.
6. Guide them to multiply $\frac{1}{2}$ by 16 to get the answer.

Thinking Corner!

Ask the student to multiply $\frac{9}{10}$ by $\frac{10}{3}$. Ask them to multiply using the commutative property of multiplication.



$\frac{7}{10}$ of the 10 vehicles are trucks. How many trucks are there?

$\frac{7}{10} \times 10 = \frac{7}{10} \times \frac{10}{1}$

We can simplify the fractions first to make the multiplication easier.

$\frac{7}{10} \times 10 = \frac{7}{\cancel{10}_{1}} \times \frac{\cancel{10}^{1}}{1}$

$= \frac{7 \times 1}{1 \times 1}$

$= \frac{7}{1}$

$= 7$

We can divide the numerator and the denominator of the fractions with their common factor.

There are 7 trucks.

$\frac{1}{2}$ of the 16 apples in the basket are red. How many red apples are there?

$\frac{1}{2} \times 16 = \frac{1}{\cancel{2}_{1}} \times \frac{\cancel{16}^{8}}{1}$

$= \frac{1 \times 8}{1 \times 1}$

$= \frac{8}{1}$

$= 8$

There are 8 red apples.

Thinking corner!

Why can we simplify the numerator and denominator of different fractions during the multiplication of the fractions?

Recall the commutative property of multiplication:

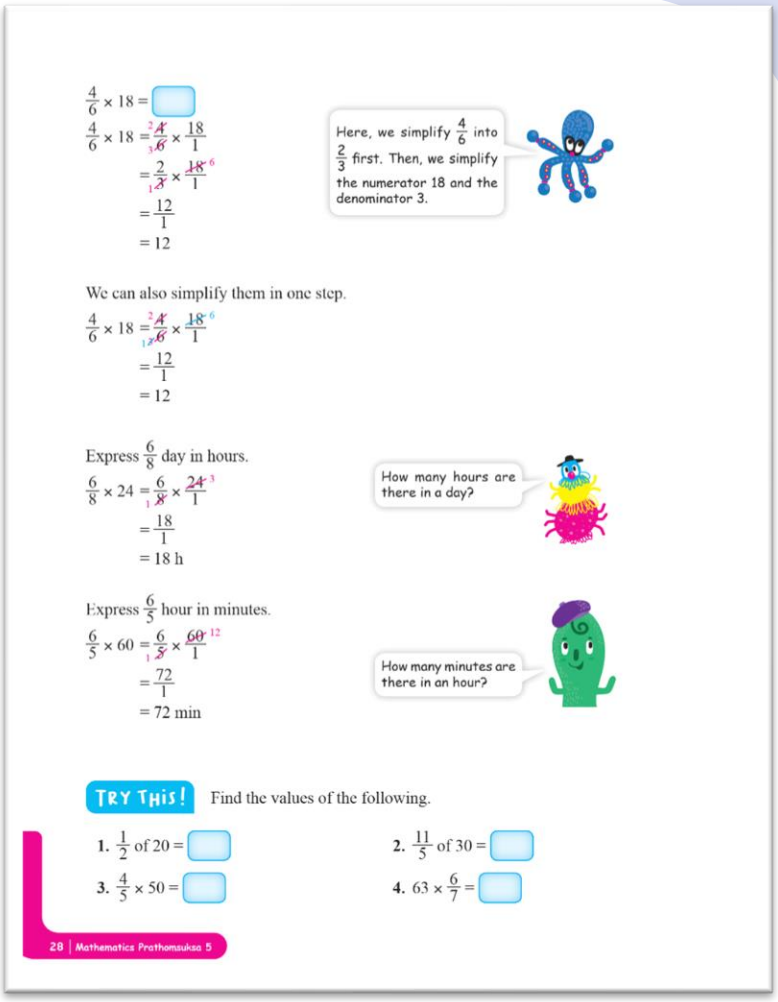
$a \times b = b \times a$

$\frac{a \times b}{c \times d} = \frac{b \times a}{c \times d} = \frac{a \times b}{d \times c} = \frac{b \times a}{d \times c}$

Chapter 2 | 27

More Tasks

or visit
https://wordwall.net/play/33636/820/959



$\frac{4}{6} \times 18 =$ ☐

$\frac{4}{6} \times 18 = \frac{2}{3} \times \frac{18}{1}$

$= \frac{2}{1} \times \frac{18^{6}}{1}$

$= \frac{12}{1}$

$= 12$

Here, we simplify $\frac{4}{6}$ into $\frac{2}{3}$ first. Then, we simplify the numerator 18 and the denominator 3.

We can also simplify them in one step.

$\frac{4}{6} \times 18 = \frac{2}{3} \times \frac{18^{6}}{1}$

$= \frac{12}{1}$

$= 12$

Express $\frac{6}{8}$ day in hours.

$\frac{6}{8} \times 24 = \frac{6}{1} \times \frac{24^{3}}{1}$

$= \frac{18}{1}$

$= 18$ h

How many hours are there in a day?

Express $\frac{6}{5}$ hour in minutes.

$\frac{6}{5} \times 60 = \frac{6}{1} \times \frac{60^{12}}{1}$

$= \frac{72}{1}$

$= 72$ min

How many minutes are there in an hour?

TRY THIS! Find the values of the following.

1. $\frac{1}{2}$ of 20 = ☐
2. $\frac{11}{5}$ of 30 = ☐
3. $\frac{4}{5} \times 50 =$ ☐
4. $63 \times \frac{6}{7} =$ ☐

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Activity for Reinforcement

The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

28 of $\frac{3}{4}$ = ☐

$\frac{5}{12}$ of 72 = ☐

$\frac{6}{7}$ x 112 = ☐

60 x $\frac{2}{3}$ = ☐

Teaching ideas

7. Tell the students that in some multiplication, we simplify the multiplication a few times in a step.
8. Use the example to explain further.
9. Guide the students to find the number of hours when given a fraction of a day, and the number of minutes when given a fraction of an hour.
10. Use the examples to explain.
11. Guide the students to refer to **Starting Point** on page 24. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 4 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 19 to 22 in Go Get Maths Workbook P5.

Lesson 3
Multiplication of fractions

Lesson objectives
By the end of the lesson, the students should be able to:

1. Multiply proper fractions.
2. Multiply proper fractions by improper fractions.
3. Multiply improper fractions.

Suggested teaching time
3 periods (3 x 50 minutes)

Vocabulary
Multiplication

Materials needed
Square paper

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

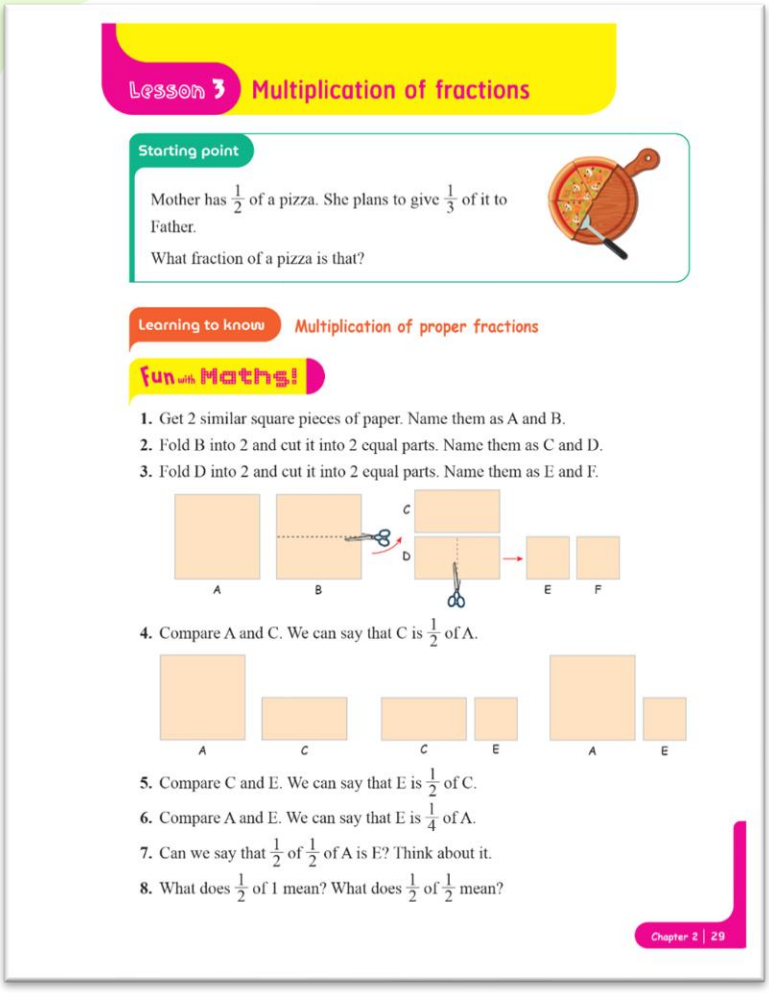
Fun with Maths!
Materials required: Square paper
Objective of the activity: Understanding a fraction out of another fraction

Put C on top of A and tell them C is $\frac{1}{2}$ of A.

Put E on top of C and tell them E is $\frac{1}{2}$ of C.

Put E on top of A and tell them E is $\frac{1}{4}$ of A.

Put E on top of C which is on top of A. Tell them that E = $\frac{1}{4}$ of A = $\frac{1}{2}$ of $\frac{1}{2}$ of A. So, we can conclude that $\frac{1}{4}$ = $\frac{1}{2}$ of $\frac{1}{2}$.



Lesson 3 Multiplication of fractions

Starting point

Mother has $\frac{1}{2}$ of a pizza. She plans to give $\frac{1}{3}$ of it to Father.

What fraction of a pizza is that?

Learning to know Multiplication of proper fractions

Fun with Maths!

1. Get 2 similar square pieces of paper. Name them as A and B.
2. Fold B into 2 and cut it into 2 equal parts. Name them as C and D.
3. Fold D into 2 and cut it into 2 equal parts. Name them as E and F.

A B C D E F

4. Compare A and C. We can say that C is $\frac{1}{2}$ of A.

A C C E A E

5. Compare C and E. We can say that E is $\frac{1}{2}$ of C.
6. Compare A and E. We can say that E is $\frac{1}{4}$ of A.
7. Can we say that $\frac{1}{2}$ of $\frac{1}{2}$ of A is E? Think about it.
8. What does $\frac{1}{2}$ of 1 mean? What does $\frac{1}{2}$ of $\frac{1}{2}$ mean?

Chapter 2 | 29

Kevin brought $\frac{1}{2}$ of a pizza. He ate $\frac{1}{2}$ of it. What fraction of the pizza did he eat?

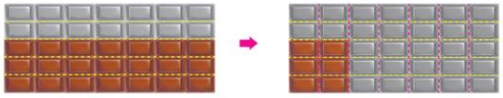
$\frac{1}{2}$ of the pizza

$\frac{1}{2}$ of $\frac{1}{2}$ of the pizza

$$\frac{1}{2} \text{ of } \frac{1}{2} = \frac{1}{2} \times \frac{1}{2}$$
$$= \frac{1 \times 1}{2 \times 2}$$
$$= \frac{1}{4}$$

He ate $\frac{1}{4}$ of the pizza.

Mary had $\frac{3}{5}$ of a chocolate bar. She ate $\frac{2}{7}$ of it. What fraction of the chocolate bar did she eat?



$\frac{3}{5}$ of the chocolate bar

$\frac{2}{7}$ of $\frac{3}{5}$ of the chocolate bar

$$\frac{2}{7} \text{ of } \frac{3}{5} = \frac{2}{7} \times \frac{3}{5}$$
$$= \frac{2 \times 3}{7 \times 5}$$
$$= \frac{6}{35}$$

She ate $\frac{6}{35}$ of the chocolate bar.

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Teaching ideas

1. Guide the students to understand what $\frac{1}{2}$ of $\frac{1}{2}$ means using the example. Tell them that a fraction out of another fraction gives a smaller fraction.
2. Guide them to multiply $\frac{1}{2}$ by $\frac{1}{2}$.
3. Guide the students to understand what $\frac{2}{7}$ of $\frac{3}{5}$ means using the example.
4. Guide them to multiply $\frac{2}{7}$ by $\frac{3}{5}$.

Activity for Reinforcement

The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{3}{4}$ of $\frac{1}{2}$ = ☐

$\frac{5}{9}$ of $\frac{3}{10}$ = ☐

$\frac{4}{7}$ x $\frac{7}{12}$ = ☐

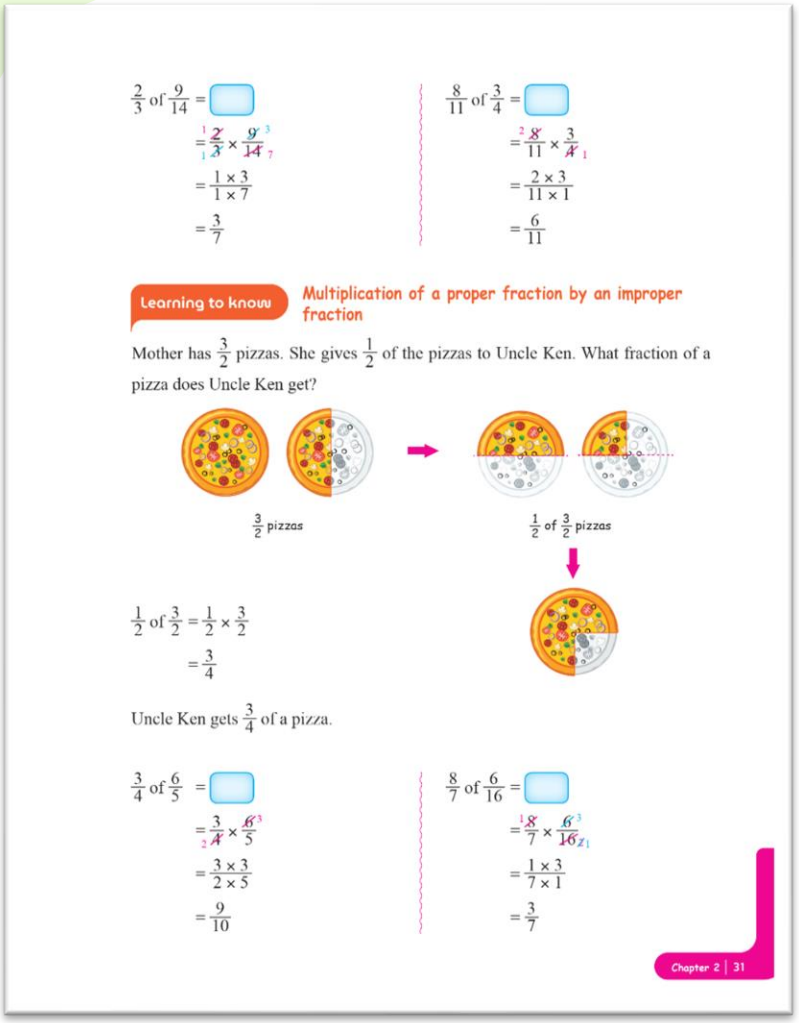
$\frac{7}{8}$ x $\frac{4}{5}$ = ☐

Teaching ideas

5. Use the examples to explain further. Reiterate that the final answers should be as simple as possible.

Teaching ideas

1. Guide the students to understand what $\frac{1}{2}$ of $\frac{3}{2}$ means using the example.
2. Guide them to multiply $\frac{1}{2}$ by $\frac{3}{2}$.
3. Use the examples to explain further. Reiterate that the final answers should be as simple as possible.



$\frac{2}{3}$ of $\frac{9}{14}$ = $\square$

$= \frac{1}{1}\frac{2}{3} \times \frac{9^{3}}{14_{7}}$

$= \frac{1 \times 3}{1 \times 7}$

$= \frac{3}{7}$

$\frac{8}{11}$ of $\frac{3}{4}$ = $\square$

$= \frac{2}{11}\frac{8}{} \times \frac{3}{4_{1}}$

$= \frac{2 \times 3}{11 \times 1}$

$= \frac{6}{11}$

Learning to know: Multiplication of a proper fraction by an improper fraction

Mother has $\frac{3}{2}$ pizzas. She gives $\frac{1}{2}$ of the pizzas to Uncle Ken. What fraction of a pizza does Uncle Ken get?

$\frac{3}{2}$ pizzas

$\frac{1}{2}$ of $\frac{3}{2}$ pizzas

$\frac{1}{2}$ of $\frac{3}{2} = \frac{1}{2} \times \frac{3}{2}$

$= \frac{3}{4}$

Uncle Ken gets $\frac{3}{4}$ of a pizza.

$\frac{3}{4}$ of $\frac{6}{5}$ = $\square$

$= \frac{3}{2}\frac{}{4} \times \frac{6^{3}}{5}$

$= \frac{3 \times 3}{2 \times 5}$

$= \frac{9}{10}$

$\frac{8}{7}$ of $\frac{6}{16}$ = $\square$

$= \frac{1}{7}\frac{8}{} \times \frac{6^{3}}{16_{8_{1}}}$

$= \frac{1 \times 3}{7 \times 1}$

$= \frac{3}{7}$

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More Info

or visit
http://tiny.cc/41osuz

Activity for Reinforcement

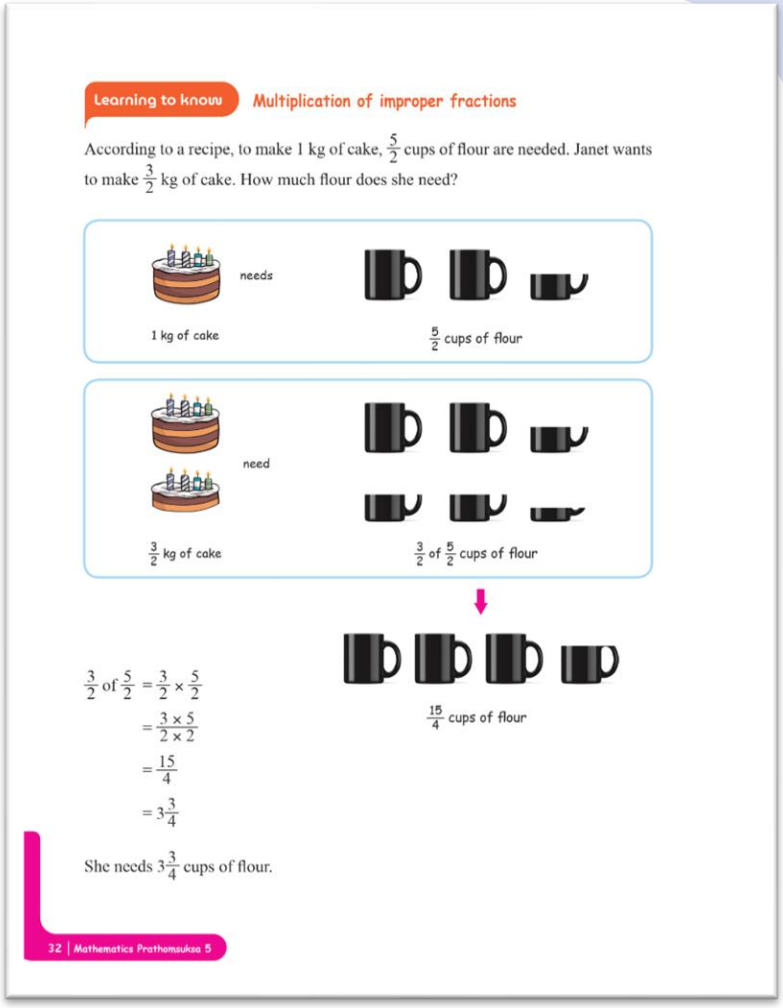
The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{1}{2}$ of $\frac{8}{7}$ = $\square$

$\frac{13}{10}$ of $\frac{2}{5}$ = $\square$

$\frac{5}{3}$ x $\frac{6}{5}$ = $\square$

$\frac{3}{2}$ x $\frac{7}{9}$ = $\square$



Learning to know Multiplication of improper fractions

According to a recipe, to make 1 kg of cake, $\frac{5}{2}$ cups of flour are needed. Janet wants to make $\frac{3}{2}$ kg of cake. How much flour does she need?

needs

1 kg of cake

$\frac{5}{2}$ cups of flour

need

$\frac{3}{2}$ kg of cake

$\frac{3}{2}$ of $\frac{5}{2}$ cups of flour

$\frac{15}{4}$ cups of flour

$\frac{3}{2}$ of $\frac{5}{2} = \frac{3}{2} \times \frac{5}{2}$

$= \frac{3 \times 5}{2 \times 2}$

$= \frac{15}{4}$

$= 3\frac{3}{4}$

She needs $3\frac{3}{4}$ cups of flour.

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Teaching ideas

1. Guide the students to understand what $\frac{3}{2}$ of $\frac{5}{2}$ means using the example.
2. Guide them to multiply $\frac{3}{2}$ by $\frac{5}{2}$.

Activity for Reinforcement

The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{7}{3}$ of $\frac{3}{2}$ = ☐

$\frac{7}{4}$ of $\frac{8}{5}$ = ☐

$\frac{5}{3}$ x $\frac{12}{7}$ = ☐

$\frac{12}{5}$ x $\frac{15}{12}$ = ☐

Teaching ideas

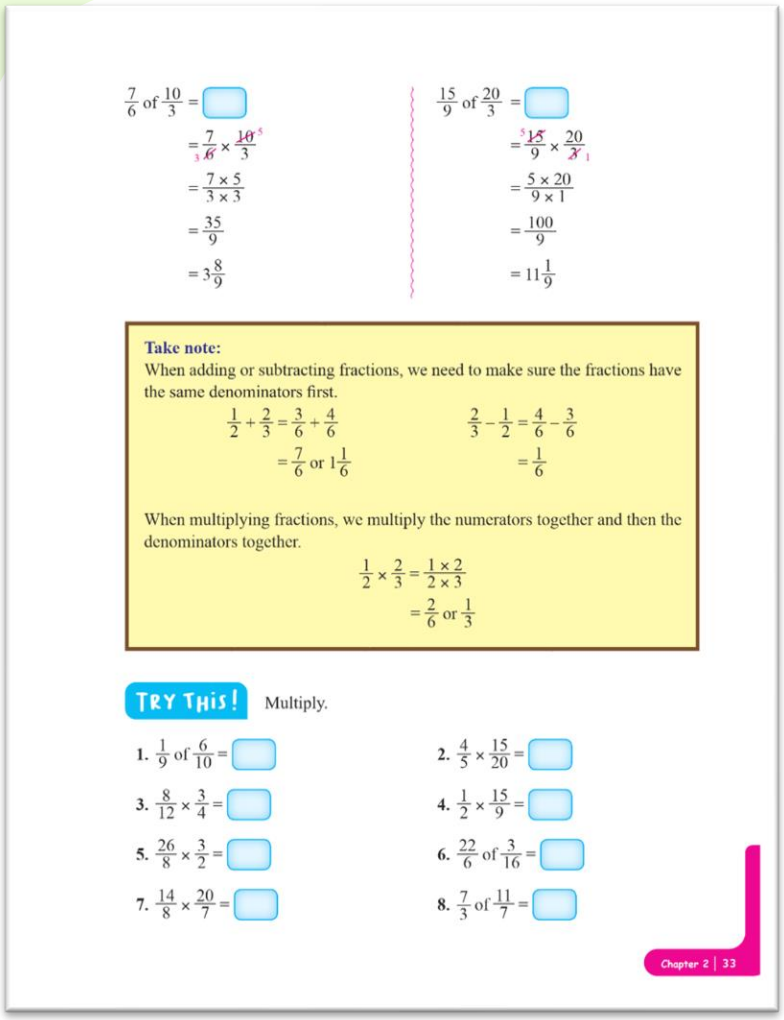
3. Use the examples to explain further. Reiterate that the final answers should be as simple as possible.
4. Help the students to clarify that multiplication of fractions is the multiplication of the numerators and the multiplication of the denominators. No equivalent of fractions with similar denominators are needed for multiplication.
5. Guide the students to refer to **Starting Point** on page 29. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 8 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 23 to 26 in Go Get Maths Workbook P5.



$\frac{7}{6}$ of $\frac{10}{3}$ = ☐

$= \frac{7}{\cancel{6}_{3}} \times \frac{\cancel{10}^{5}}{3}$

$= \frac{7 \times 5}{3 \times 3}$

$= \frac{35}{9}$

$= 3\frac{8}{9}$

$\frac{15}{9}$ of $\frac{20}{3}$ = ☐

$= \frac{\cancel{15}^{5}}{9} \times \frac{20}{\cancel{3}_{1}}$

$= \frac{5 \times 20}{9 \times 1}$

$= \frac{100}{9}$

$= 11\frac{1}{9}$

Take note:

When adding or subtracting fractions, we need to make sure the fractions have the same denominators first.

$\frac{1}{2} + \frac{2}{3} = \frac{3}{6} + \frac{4}{6}$

$= \frac{7}{6}$ or $1\frac{1}{6}$

$\frac{2}{3} - \frac{1}{2} = \frac{4}{6} - \frac{3}{6}$

$= \frac{1}{6}$

When multiplying fractions, we multiply the numerators together and then the denominators together.

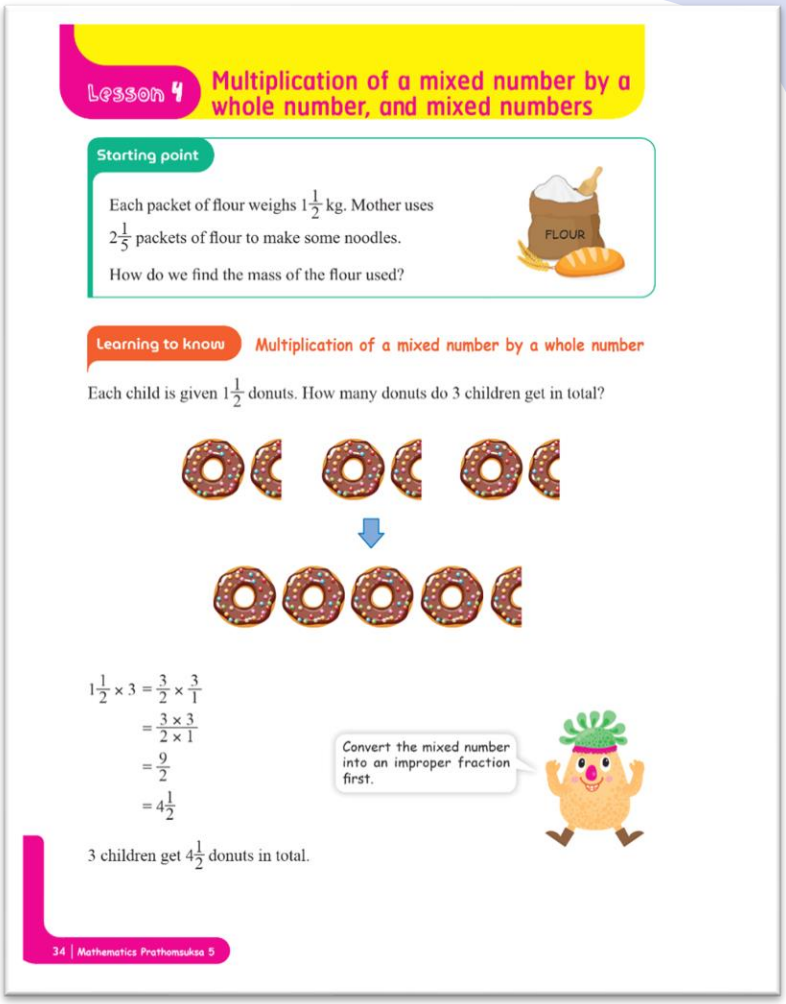
$\frac{1}{2} \times \frac{2}{3} = \frac{1 \times 2}{2 \times 3}$

$= \frac{2}{6}$ or $\frac{1}{3}$

TRY THIS! Multiply.

1. $\frac{1}{9}$ of $\frac{6}{10}$ = ☐
2. $\frac{4}{5} \times \frac{15}{20}$ = ☐
3. $\frac{8}{12} \times \frac{3}{4}$ = ☐
4. $\frac{1}{2} \times \frac{15}{9}$ = ☐
5. $\frac{26}{8} \times \frac{3}{2}$ = ☐
6. $\frac{22}{6}$ of $\frac{3}{16}$ = ☐
7. $\frac{14}{8} \times \frac{20}{7}$ = ☐
8. $\frac{7}{3}$ of $\frac{11}{7}$ = ☐

Chapter 2 | 33



Lesson 4 Multiplication of a mixed number by a whole number, and mixed numbers

Starting point

Each packet of flour weighs $1\frac{1}{2}$ kg. Mother uses $2\frac{1}{5}$ packets of flour to make some noodles.

How do we find the mass of the flour used?

Learning to know Multiplication of a mixed number by a whole number

Each child is given $1\frac{1}{2}$ donuts. How many donuts do 3 children get in total?

$$1\frac{1}{2} \times 3 = \frac{3}{2} \times \frac{3}{1}$$
$$= \frac{3 \times 3}{2 \times 1}$$
$$= \frac{9}{2}$$
$$= 4\frac{1}{2}$$

Convert the mixed number into an improper fraction first.

3 children get $4\frac{1}{2}$ donuts in total.

Lesson 4
Multiplication of a mixed number by a whole number, and mixed numbers

Lesson objectives

By the end of the lesson, the students should be able to:

1. Multiply a mixed number by a whole number.
2. Multiply mixed numbers.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

Multiplication

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

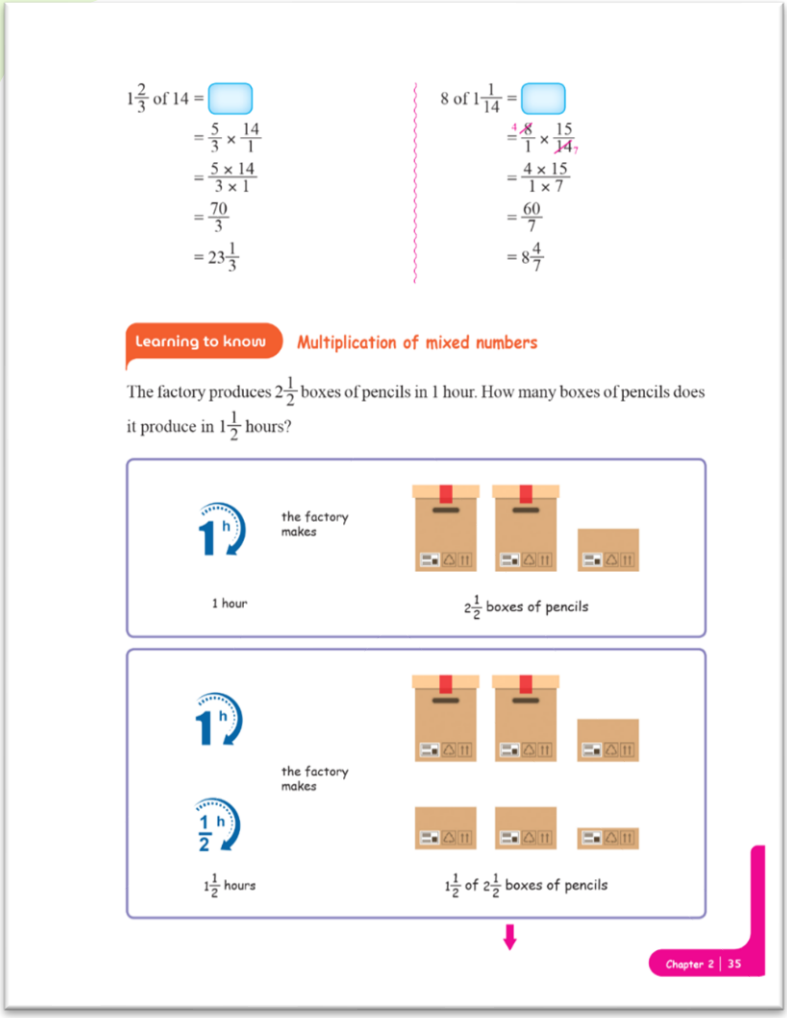
1. Remind the students that multiplication is repeated addition, even for fractions.
2. Use the example to show the meaning of multiplication of $1\frac{1}{2}$ by 3.
3. Tell the students that when we multiply a mixed number by a whole number, we need to convert the mixed number into an improper fraction first before multiplying.
4. Guide them how to multiply.

Teaching ideas

5. Use the examples to explain further.

Teaching ideas

1. Use the example to show the meaning of multiplication of $2\frac{1}{2}$ by $1\frac{1}{2}$.
2. Tell the students that when we multiply mixed numbers, we need to convert the mixed numbers into improper fractions first before multiplying.
3. Guide them how to multiply.



$1\frac{2}{3}$ of 14 = ☐

$= \frac{5}{3} \times \frac{14}{1}$

$= \frac{5 \times 14}{3 \times 1}$

$= \frac{70}{3}$

$= 23\frac{1}{3}$

8 of $1\frac{1}{14}$ = ☐

$= \frac{8}{1} \times \frac{15}{14}$

$= \frac{4 \times 15}{1 \times 7}$

$= \frac{60}{7}$

$= 8\frac{4}{7}$

Learning to know Multiplication of mixed numbers

The factory produces $2\frac{1}{2}$ boxes of pencils in 1 hour. How many boxes of pencils does it produce in $1\frac{1}{2}$ hours?

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Activity for Reinforcement

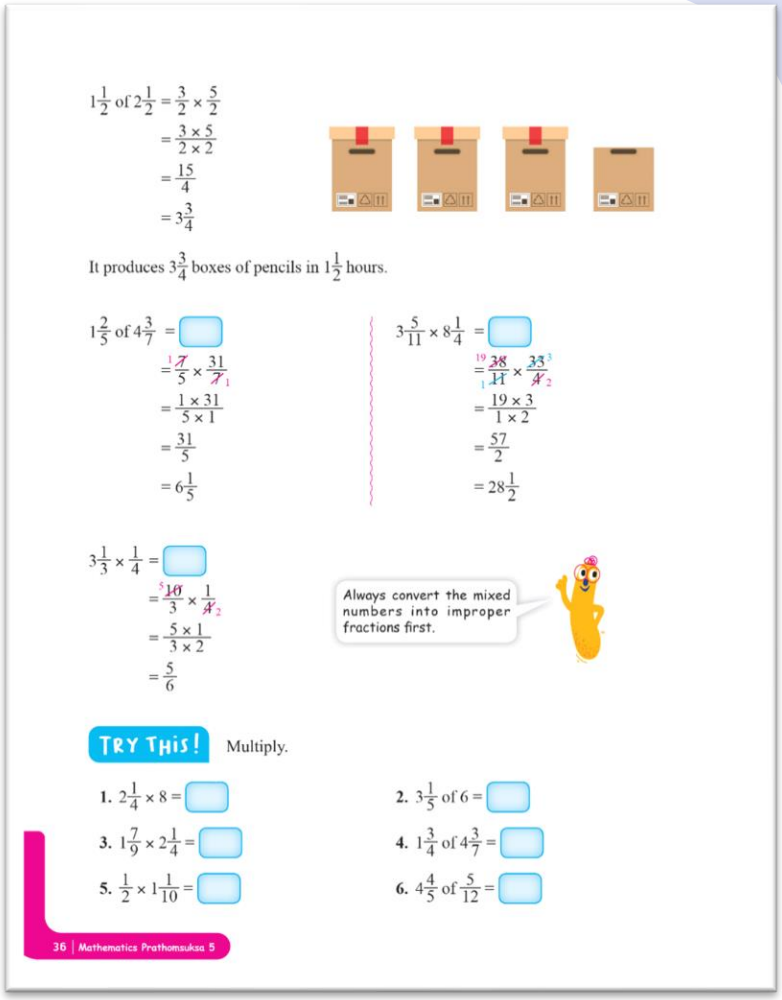
The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$1\frac{1}{4}$ of 20 = ☐

30 of $2\frac{1}{2}$ = ☐

6 x $3\frac{3}{10}$ = ☐

$4\frac{5}{8}$ x 4 = ☐



$1\frac{1}{2}$ of $2\frac{1}{2} = \frac{3}{2} \times \frac{5}{2}$

$= \frac{3 \times 5}{2 \times 2}$

$= \frac{15}{4}$

$= 3\frac{3}{4}$

It produces $3\frac{3}{4}$ boxes of pencils in $1\frac{1}{2}$ hours.

$1\frac{2}{5}$ of $4\frac{3}{7} =$ ☐

$= \frac{1\cancel{7}}{5} \times \frac{31}{\cancel{7}_1}$

$= \frac{1 \times 31}{5 \times 1}$

$= \frac{31}{5}$

$= 6\frac{1}{5}$

$3\frac{5}{11} \times 8\frac{1}{4} =$ ☐

$= \frac{{}^{19}\cancel{38}}{\cancel{11}_1} \times \frac{\cancel{33}^{3}}{\cancel{4}_2}$

$= \frac{19 \times 3}{1 \times 2}$

$= \frac{57}{2}$

$= 28\frac{1}{2}$

$3\frac{1}{3} \times \frac{1}{4} =$ ☐

$= \frac{{}^{5}\cancel{10}}{3} \times \frac{1}{\cancel{4}_2}$

$= \frac{5 \times 1}{3 \times 2}$

$= \frac{5}{6}$

Always convert the mixed numbers into improper fractions first.

TRY THIS! Multiply.

1. $2\frac{1}{4} \times 8 =$ ☐
2. $3\frac{1}{5}$ of $6 =$ ☐
3. $1\frac{7}{9} \times 2\frac{1}{4} =$ ☐
4. $1\frac{3}{4}$ of $4\frac{3}{7} =$ ☐
5. $\frac{1}{2} \times 1\frac{1}{10} =$ ☐
6. $4\frac{4}{5}$ of $\frac{5}{12} =$ ☐

Activity for Reinforcement

The students need to practice more in order to multiply correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$1\frac{3}{4}$ of $2\frac{1}{2} =$ ☐

$3\frac{3}{5}$ of $1\frac{1}{4} =$ ☐

$1\frac{2}{3} \times 1\frac{3}{10} =$ ☐

$2\frac{4}{7} \times 2\frac{1}{6} =$ ☐

Teaching ideas

4. Use the examples to explain further.
5. Guide the students to refer to **Starting Point** on page 34. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 26 and 27 in Go Get Maths Workbook P5.

HOTS QS

or visit
http://tiny.cc/e1osuz

Lesson 5
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving multiplication of fractions.
2. Solve 2-step word problems involving multiplication of fractions.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

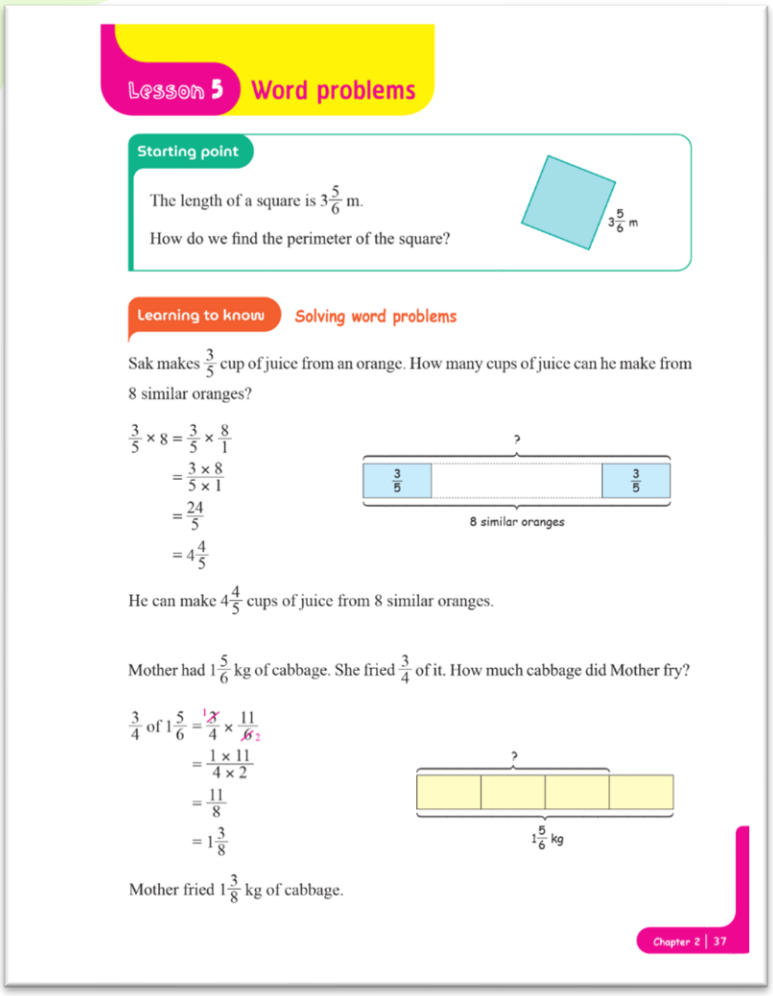
1. Reiterate the 3 simple steps to solve a word problem.

   Step 1: Understand the problem

   Step 2: Plan and execute

   Step 3: Check the answer

2. Work with them the 3 steps in solving the word problems.



Lesson 5 Word problems

Starting point

The length of a square is $3\frac{5}{6}$ m.

How do we find the perimeter of the square?

$3\frac{5}{6}$ m

Learning to know Solving word problems

Sak makes $\frac{3}{5}$ cup of juice from an orange. How many cups of juice can he make from 8 similar oranges?

$\frac{3}{5} \times 8 = \frac{3}{5} \times \frac{8}{1}$

$= \frac{3 \times 8}{5 \times 1}$

$= \frac{24}{5}$

$= 4\frac{4}{5}$

? $\frac{3}{5}$ $\frac{3}{5}$ 8 similar oranges

He can make $4\frac{4}{5}$ cups of juice from 8 similar oranges.

Mother had $1\frac{5}{6}$ kg of cabbage. She fried $\frac{3}{4}$ of it. How much cabbage did Mother fry?

$\frac{3}{4}$ of $1\frac{5}{6} = \frac{3}{4} \times \frac{11}{6_2}$

$= \frac{1 \times 11}{4 \times 2}$

$= \frac{11}{8}$

$= 1\frac{3}{8}$

? $1\frac{5}{6}$ kg

Mother fried $1\frac{3}{8}$ kg of cabbage.

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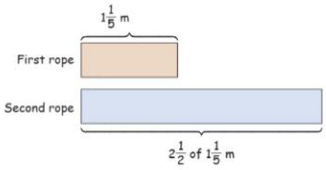
There are 3 ropes. The first rope is $1\frac{1}{5}$ m long. The length of the second rope is $2\frac{1}{2}$ times as long as the first rope. The length of the third rope is $\frac{3}{4}$ time as long as the second rope. What is the length of the second and third rope?

The first step

The first rope is $1\frac{1}{5}$ m long. The length of the second rope is $2\frac{1}{2}$ times as long as the first rope. What is the length of the second rope?

$$2\frac{1}{2} \text{ of } 1\frac{1}{5} = \frac{\overset{1}{\cancel{5}}}{\underset{1}{2}} \times \frac{\overset{3}{\cancel{6}}}{\underset{1}{\cancel{5}}}$$
$$= \frac{1 \times 3}{1 \times 1}$$
$$= \frac{3}{1}$$
$$= 3$$

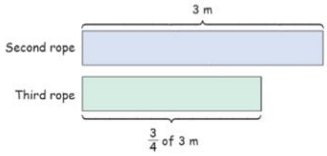


The length of the second rope is 3 m.

The second step

The second rope is 3 m long. The third rope is $\frac{3}{4}$ time as long as the second rope. What is the length of the third rope?

$$\frac{3}{4} \text{ of } 3 = \frac{3}{4} \times \frac{3}{1}$$
$$= \frac{3 \times 3}{4 \times 1}$$
$$= \frac{9}{4}$$
$$= 2\frac{1}{4} \text{ m}$$



The length of the third rope is $2\frac{1}{4}$ m.

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Teaching ideas

3. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The length of the first rope
   - The number of times the second rope longer than the first rope
   - The number of times the third rope longer than the second rope

   b) What do I need to find at the end?
   - The length of the second rope and the third roe

   c) What do I need to find out first?
   - The length of the second rope

Teaching ideas

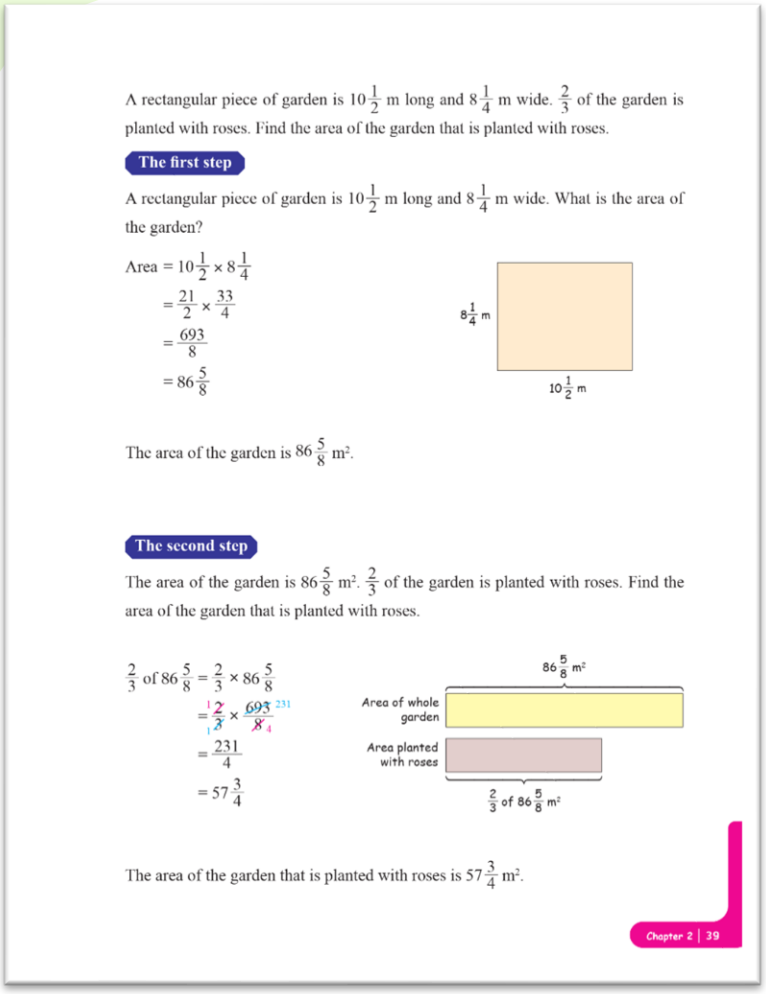
4. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The length and width of the garden
   - The fraction of the garden planted with roses

   b) What do I need to find at the end?
   - The area of garden planted with rose

   c) What do I need to find out first?
   - The area of the garden

5. Guide the students to refer to **Starting Point** on page 37. Ask them to answer the question. Have a discussion to conclude the lesson.



A rectangular piece of garden is $10\frac{1}{2}$ m long and $8\frac{1}{4}$ m wide. $\frac{2}{3}$ of the garden is planted with roses. Find the area of the garden that is planted with roses.

The first step

A rectangular piece of garden is $10\frac{1}{2}$ m long and $8\frac{1}{4}$ m wide. What is the area of the garden?

$$\text{Area} = 10\frac{1}{2} \times 8\frac{1}{4}$$
$$= \frac{21}{2} \times \frac{33}{4}$$
$$= \frac{693}{8}$$
$$= 86\frac{5}{8}$$

$8\frac{1}{4}$ m

$10\frac{1}{2}$ m

The area of the garden is $86\frac{5}{8}$ m².

The second step

The area of the garden is $86\frac{5}{8}$ m². $\frac{2}{3}$ of the garden is planted with roses. Find the area of the garden that is planted with roses.

$$\frac{2}{3} \text{ of } 86\frac{5}{8} = \frac{2}{3} \times 86\frac{5}{8}$$
$$= \frac{1}{3} \times \frac{693}{8}$$
$$= \frac{231}{4}$$
$$= 57\frac{3}{4}$$

$86\frac{5}{8}$ m²

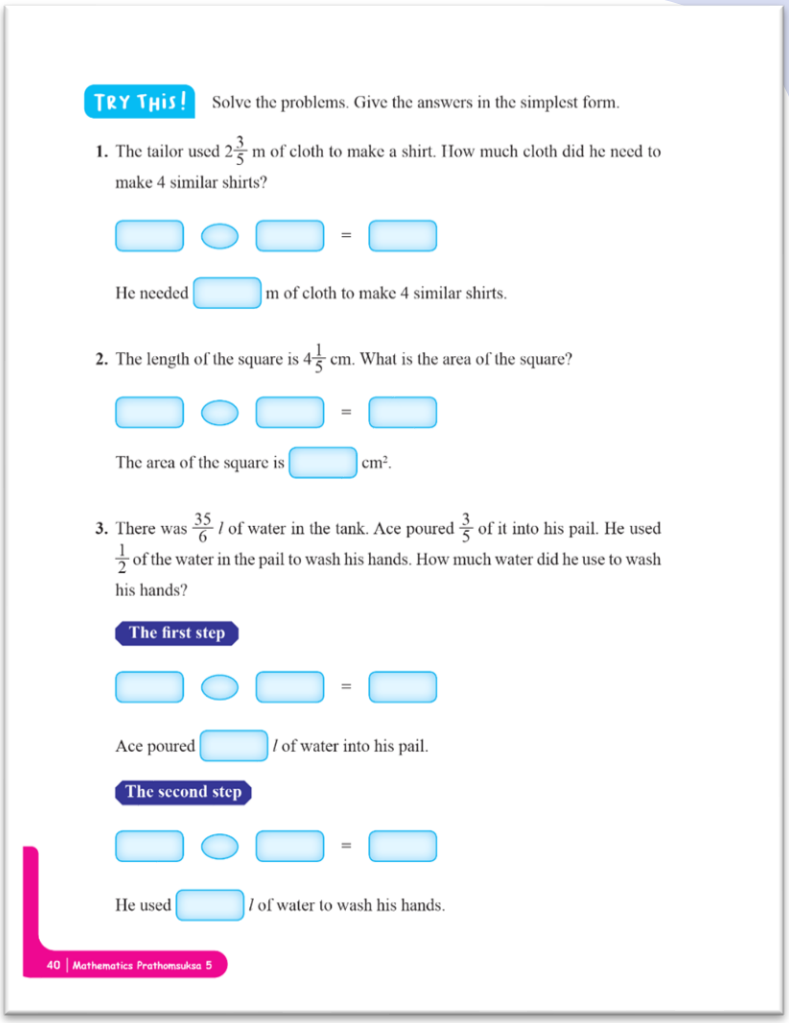
Area of whole garden

Area planted with roses

$\frac{2}{3}$ of $86\frac{5}{8}$ m²

The area of the garden that is planted with roses is $57\frac{3}{4}$ m².

Chapter 2 | 39



TRY THIS! Solve the problems. Give the answers in the simplest form.

1. The tailor used $2\frac{3}{5}$ m of cloth to make a shirt. How much cloth did he need to make 4 similar shirts?

   ☐ ⬭ ☐ = ☐

   He needed ☐ m of cloth to make 4 similar shirts.

2. The length of the square is $4\frac{1}{5}$ cm. What is the area of the square?

   ☐ ⬭ ☐ = ☐

   The area of the square is ☐ cm^2.

3. There was $\frac{35}{6}$ *l* of water in the tank. Ace poured $\frac{3}{5}$ of it into his pail. He used $\frac{1}{2}$ of the water in the pail to wash his hands. How much water did he use to wash his hands?

   The first step

   ☐ ⬭ ☐ = ☐

   Ace poured ☐ *l* of water into his pail.

   The second step

   ☐ ⬭ ☐ = ☐

   He used ☐ *l* of water to wash his hands.

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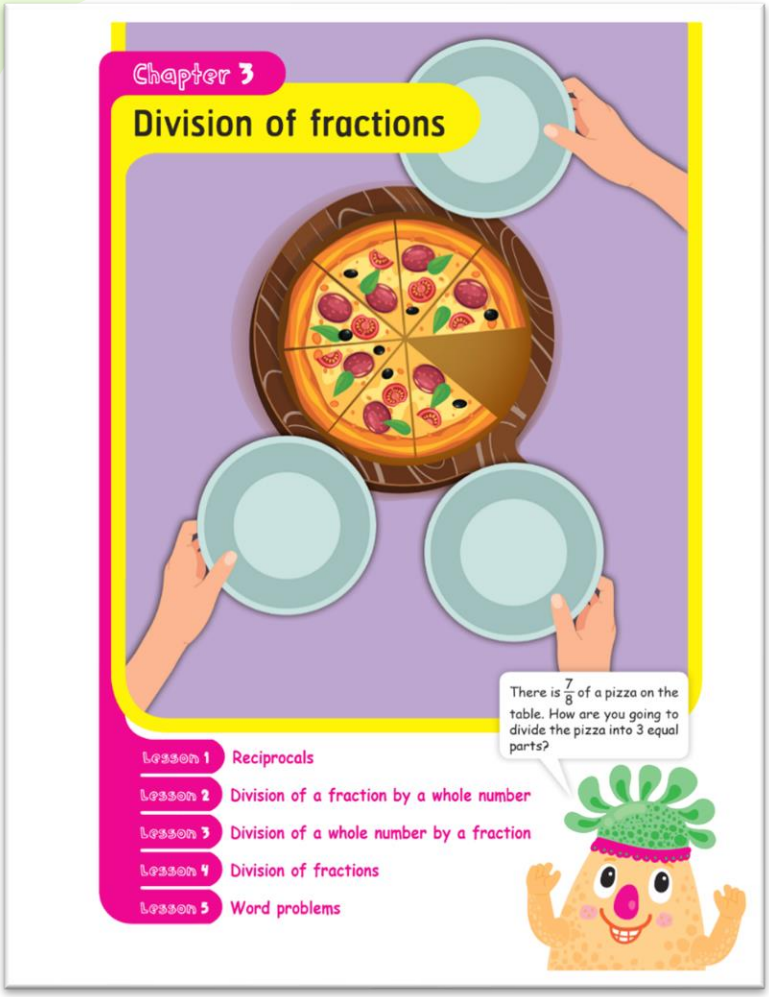
Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 28 to 34 in Go Get Maths Workbook P5.

Chapter 3
Division of fractions



The big idea

Ask the students to look at the picture carefully. Ask them these questions to start a discussion:

1. How many equal pieces was the pizza cut into?
2. How many pieces of pizza are there?
3. How many empty plates are there?
4. If equal number of pieces of pizza is placed on each plate,
   a) how many pieces of pizza would be placed on each place?
   b) how many pieces of pizza would be left?
   c) how would you divide the leftover pizza equally among the 3 plates?

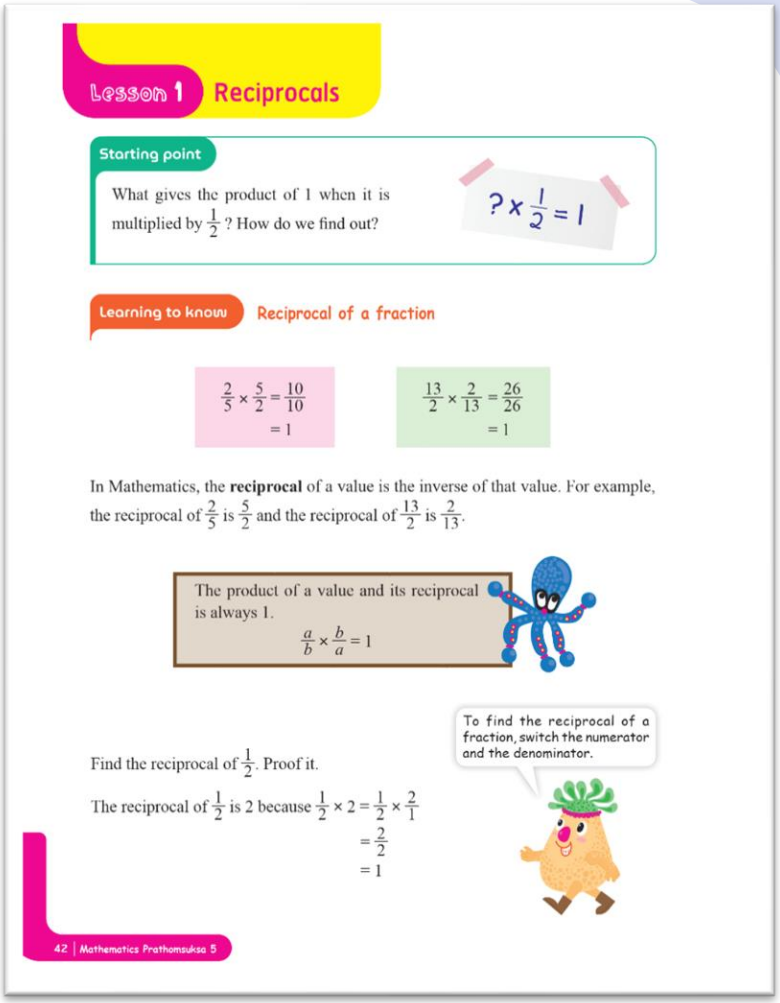
Strand 1: Numbers and Algebra

Standard M.1.1 Numbers

Indicators:

M 1.1 Gr5/4 Find the results of multiplying and dividing fractions and mixed numbers.

M 1.1 Gr5/5 Show mathematical methods of finding answers of 2- step word problems of addition, subtraction, multiplication and division.



Lesson 1 Reciprocals

Starting point

What gives the product of 1 when it is multiplied by $\frac{1}{2}$? How do we find out?

$? \times \frac{1}{2} = 1$

Learning to know Reciprocal of a fraction

$\frac{2}{5} \times \frac{5}{2} = \frac{10}{10} = 1$

$\frac{13}{2} \times \frac{2}{13} = \frac{26}{26} = 1$

In Mathematics, the **reciprocal** of a value is the inverse of that value. For example, the reciprocal of $\frac{2}{5}$ is $\frac{5}{2}$ and the reciprocal of $\frac{13}{2}$ is $\frac{2}{13}$.

The product of a value and its reciprocal is always 1.

$\frac{a}{b} \times \frac{b}{a} = 1$

To find the reciprocal of a fraction, switch the numerator and the denominator.

Find the reciprocal of $\frac{1}{2}$. Proof it.

The reciprocal of $\frac{1}{2}$ is 2 because $\frac{1}{2} \times 2 = \frac{1}{2} \times \frac{2}{1} = \frac{2}{2} = 1$

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Extra notes

Facts about a reciprocal:

- It is also called the multiplicative inverse.
- It is similar to turning the numbers upside down.
- It is also found by interchanging the numerator and denominator.
- All the numbers have reciprocal except 0.
- The product of a number and its reciprocal is equal to 1.
- Generally, the reciprocal is written as, $\frac{1}{x}$ for a number x.

Lesson 1 Reciprocals

Lesson objectives

By the end of the lesson, the students should be able to:

1. Find the reciprocal of a fraction.
2. Find the reciprocal of a mixed number.
3. Find the reciprocal of a whole number.

Suggested teaching time

2 periods (2 x 50 minutes)

Vocabulary

Reciprocal, inverse, fraction

Materials needed

-

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Explain the meaning of *reciprocal* in Mathematics to the students.
2. Tell them the product of a fraction and its reciprocal is 1.
3. To get the reciprocal of a fraction, we will just need to switch the denominator with the numerator.
4. Use the examples to explain more.

Teaching ideas

1. To get the reciprocal of a mixed number, we will need convert it into an improper fraction before switching the denominator with the numerator.
2. Use the example to explain more.

Teaching ideas

1. Help the students to recall that we can convert a whole number into an improper fraction by using the whole number as its numerator and 1 as its denominator.

$2 = \frac{2}{1}$ $3 = \frac{3}{1}$ $15 = \frac{15}{1}$ $70 = \frac{70}{1}$

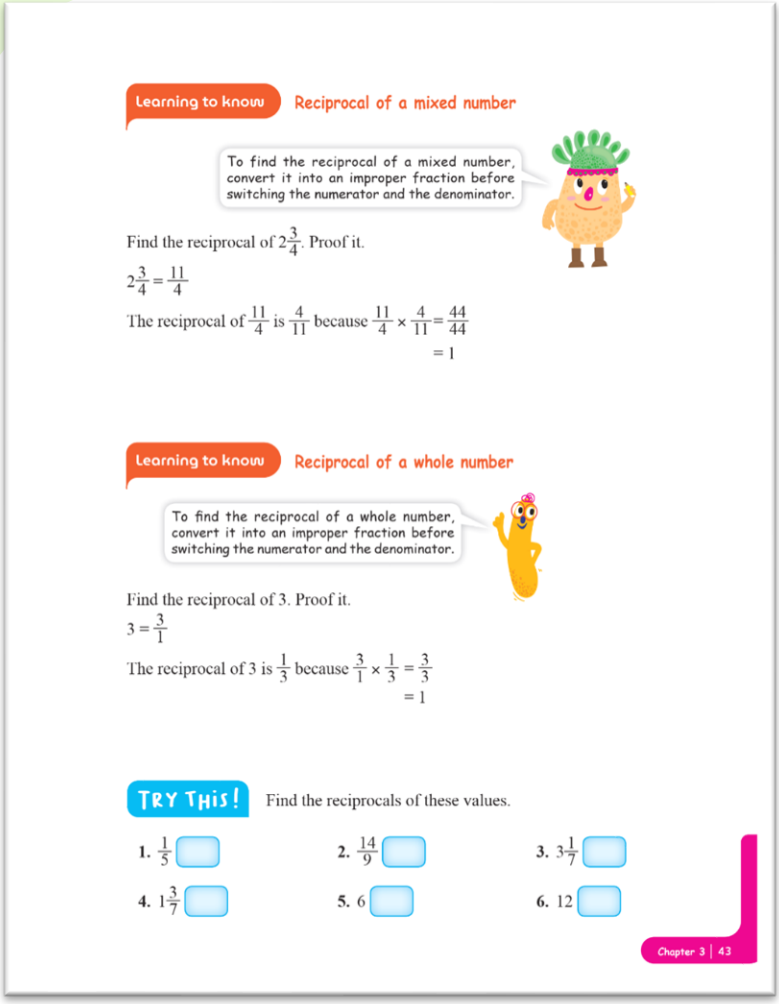
2. To get the reciprocal of a whole number, we will need convert it into an improper fraction before switching the denominator with the numerator.
3. Use the example to explain more.
4. Guide the students to refer to **Starting Point** on page 42. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on page 35 in Go Get Maths Workbook P5.



Learning to know Reciprocal of a mixed number

To find the reciprocal of a mixed number, convert it into an improper fraction before switching the numerator and the denominator.

Find the reciprocal of $2\frac{3}{4}$. Proof it.

$2\frac{3}{4} = \frac{11}{4}$

The reciprocal of $\frac{11}{4}$ is $\frac{4}{11}$ because $\frac{11}{4} \times \frac{4}{11} = \frac{44}{44}$
$= 1$

Learning to know Reciprocal of a whole number

To find the reciprocal of a whole number, convert it into an improper fraction before switching the numerator and the denominator.

Find the reciprocal of 3. Proof it.

$3 = \frac{3}{1}$

The reciprocal of 3 is $\frac{1}{3}$ because $\frac{3}{1} \times \frac{1}{3} = \frac{3}{3}$
$= 1$

TRY THIS! Find the reciprocals of these values.

1. $\frac{1}{5}$ ☐ 2. $\frac{14}{9}$ ☐ 3. $3\frac{1}{7}$ ☐
4. $1\frac{3}{7}$ ☐ 5. 6 ☐ 6. 12 ☐

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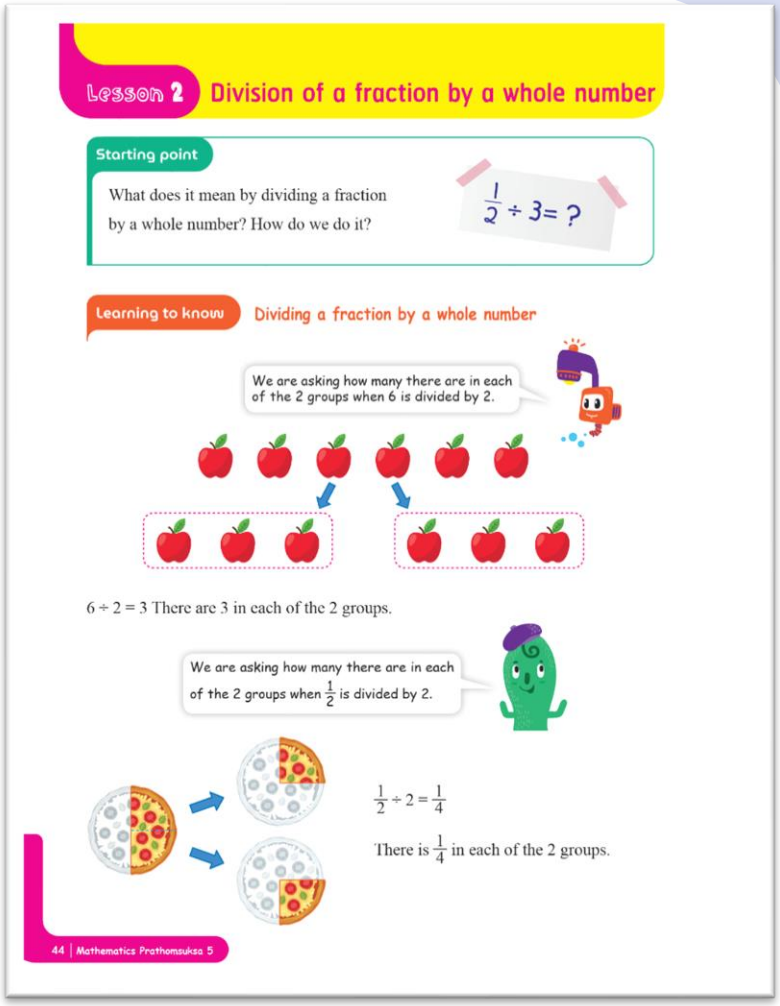

Lesson 2 Division of a fraction by a whole number

Starting point

What does it mean by dividing a fraction by a whole number? How do we do it?

$\frac{1}{2} \div 3 = ?$

Learning to know Dividing a fraction by a whole number

We are asking how many there are in each of the 2 groups when 6 is divided by 2.

$6 \div 2 = 3$ There are 3 in each of the 2 groups.

We are asking how many there are in each of the 2 groups when $\frac{1}{2}$ is divided by 2.

$\frac{1}{2} \div 2 = \frac{1}{4}$

There is $\frac{1}{4}$ in each of the 2 groups.

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Lesson 2
Division of a fraction by a whole number

Lesson objectives

By the end of the lesson, the students should be able to:

1. Divide a fraction by a whole number.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Division, reciprocal

Materials needed

Picture of a half-cut pizza

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

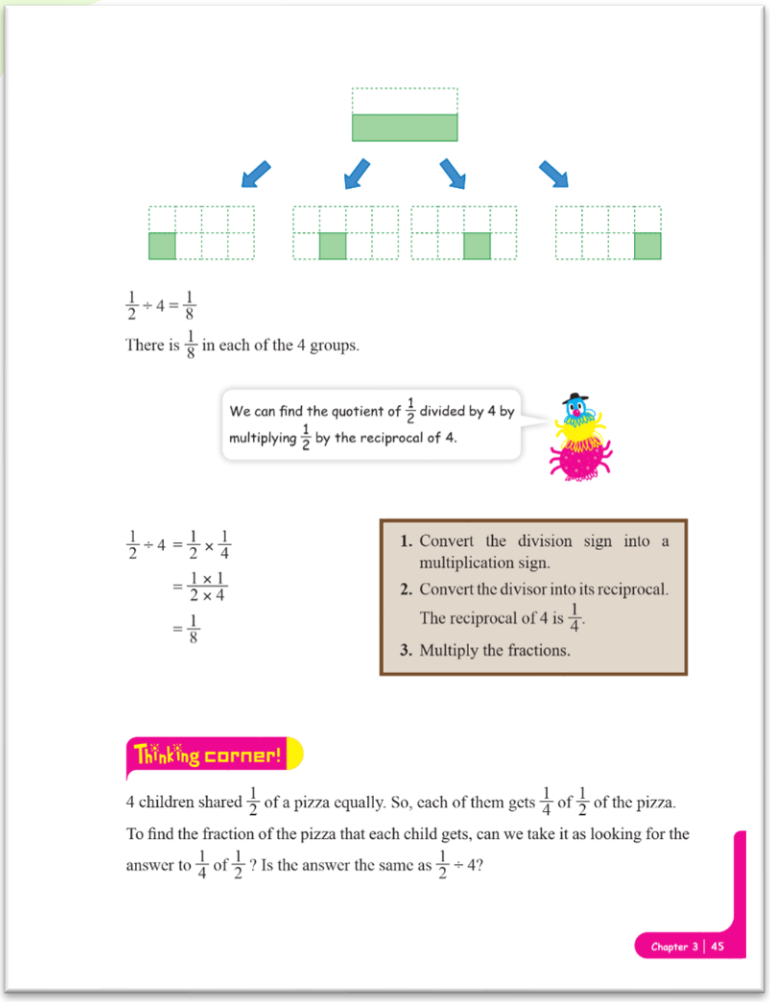
1. Use the example to help the students recall what division is.

   6 divided by 2 equals to 3.
   $6 \div 2 = 3$
   There are 3 in 2 groups.

2. Using a picture of a half-cut pizza, explain what it means by dividing $\frac{1}{2}$ into 2. There will be 2 groups of $\frac{1}{4}$.

Teaching ideas

3. Using the picture in the book, explain what it means by dividing $\frac{1}{2}$ into 4.
   There will be 4 groups of $\frac{1}{8}$.
4. Guide them to divide by multiplying the fraction by the reciprocal of the whole number.
5. Use the example to explain further. Remind them to change the multiplying sign into dividing sign and the divisor into its reciprocal.



$\frac{1}{2} \div 4 = \frac{1}{8}$

There is $\frac{1}{8}$ in each of the 4 groups.

We can find the quotient of $\frac{1}{2}$ divided by 4 by multiplying $\frac{1}{2}$ by the reciprocal of 4.

$\frac{1}{2} \div 4 = \frac{1}{2} \times \frac{1}{4}$

$= \frac{1 \times 1}{2 \times 4}$

$= \frac{1}{8}$

1. Convert the division sign into a multiplication sign.
2. Convert the divisor into its reciprocal. The reciprocal of 4 is $\frac{1}{4}$.
3. Multiply the fractions.

Thinking corner!

4 children shared $\frac{1}{2}$ of a pizza equally. So, each of them gets $\frac{1}{4}$ of $\frac{1}{2}$ of the pizza. To find the fraction of the pizza that each child gets, can we take it as looking for the answer to $\frac{1}{4}$ of $\frac{1}{2}$? Is the answer the same as $\frac{1}{2} \div 4$?

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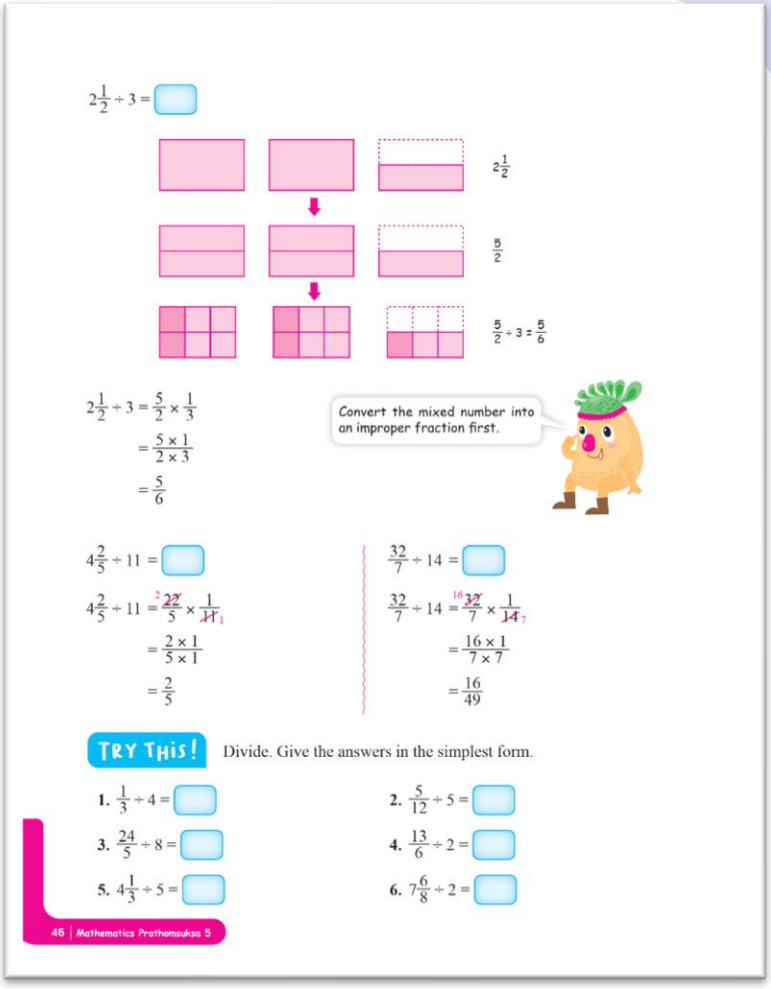
Thinking Corner!

There is $\frac{1}{2}$ of a pizza. There are 4 children to share the pizza equally. So, each child gets

a) $\frac{1}{4}$ of $\frac{1}{2}$ of a pizza
$= \frac{1}{4} \times \frac{1}{2}$
$= \frac{1}{8}$ of a pizza

b) $\frac{1}{2} \div 4$
$= \frac{1}{2} \times \frac{1}{4}$
$= \frac{1}{8}$ of a pizza

So, both calculations give the same result.



$2\frac{1}{2} \div 3 =$ ☐

$2\frac{1}{2}$

$\frac{5}{2}$

$\frac{5}{2} \div 3 = \frac{5}{6}$

$2\frac{1}{2} \div 3 = \frac{5}{2} \times \frac{1}{3}$

$= \frac{5 \times 1}{2 \times 3}$

$= \frac{5}{6}$

Convert the mixed number into an improper fraction first.

$4\frac{2}{5} \div 11 =$ ☐

$4\frac{2}{5} \div 11 = \frac{22}{5} \times \frac{1}{11}$

$= \frac{2 \times 1}{5 \times 1}$

$= \frac{2}{5}$

$\frac{32}{7} \div 14 =$ ☐

$\frac{32}{7} \div 14 = \frac{16}{7} \times \frac{1}{14}$

$= \frac{16 \times 1}{7 \times 7}$

$= \frac{16}{49}$

TRY THIS! Divide. Give the answers in the simplest form.

1. $\frac{1}{3} \div 4 =$ ☐
2. $\frac{5}{12} \div 5 =$ ☐
3. $\frac{24}{5} \div 8 =$ ☐
4. $\frac{13}{6} \div 2 =$ ☐
5. $4\frac{1}{3} \div 5 =$ ☐
6. $7\frac{6}{8} \div 2 =$ ☐

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Activity for Reinforcement

The students need to practice more in order to divide correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$\frac{3}{4} \div 2 =$ ☐

$\frac{8}{3} \div 4 =$ ☐

$1\frac{1}{5} \div 3 =$ ☐

$2\frac{4}{9} \div 11 =$ ☐

Teaching ideas

6. Using the picture in the book, explain what it means by dividing $2\frac{1}{2}$ into 3. There will be 3 groups of $\frac{5}{6}$.
7. Guide them to divide by dividing the fraction by the reciprocal of the whole number.
8. Use the examples to explain further. Remind them to change the multiplying sign into dividing sign and the divisor into its reciprocal.
9. Guide the students to refer to **Starting Point** on page 44. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 36 to 38 in Go Get Maths Workbook P5.

Lesson 3
Division of a whole number by a fraction

Lesson objectives
By the end of the lesson, the students should be able to:

1. Divide a whole number by a fraction.

Suggested teaching time
3 periods (3 x 50 minutes)

Vocabulary
Division, reciprocal

Materials needed
Pictures of a pizza

Starting point
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

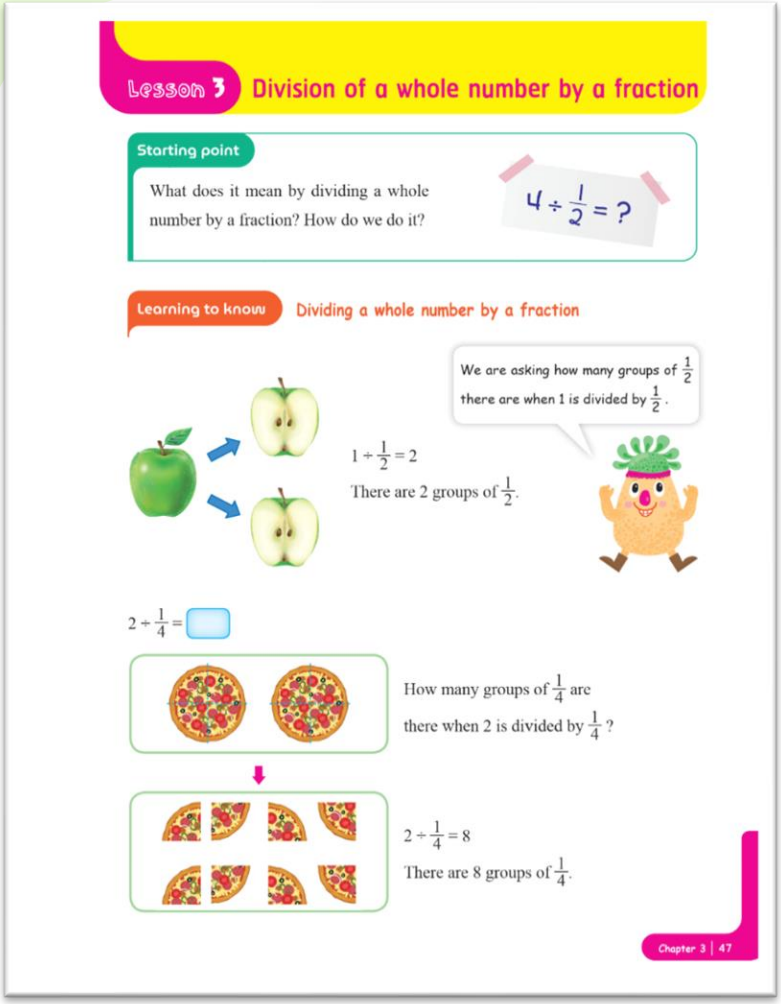
Teaching ideas
1. Use the example to help the students recall what division is when a whole number is divided by a fraction.

   1 divided by $\frac{1}{2}$ equals to 2.

   $1 \div \frac{1}{2} = 2$

   There are 2 groups of $\frac{1}{2}$.

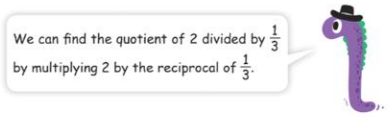
2. Using 2 pictures of a pizza, explain what it means by dividing 2 into $\frac{1}{4}$. There will be 8 groups of $\frac{1}{4}$.



2 chocolate bars are divided equally into thirds.

$2 \div \frac{1}{3} = 6$

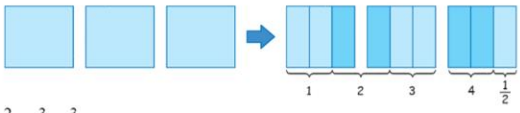
There are 6 thirds in 2 wholes.



$$2 \div \frac{1}{3} = 2 \times 3$$
$$= 6$$

1. Convert the division sign into a multiplication sign.
2. Convert the divisor into its reciprocal. The reciprocal of $\frac{1}{3}$ is 3.
3. Multiply them.

$3 \div \frac{2}{3} = \square$



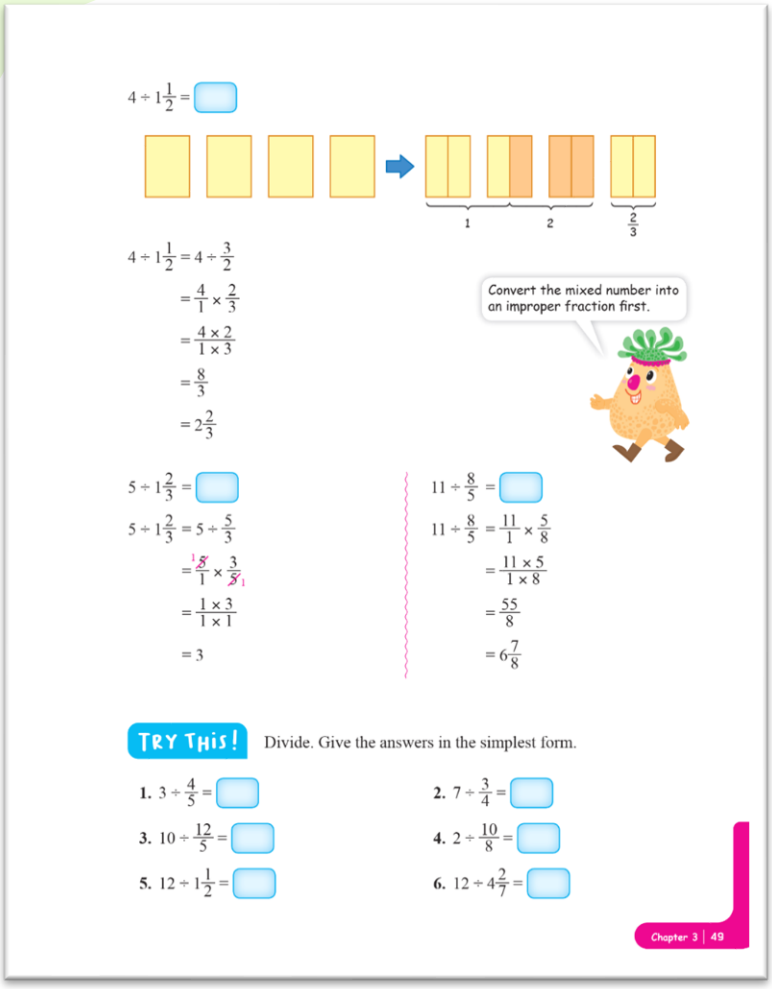
$$3 \div \frac{2}{3} = \frac{3}{1} \times \frac{3}{2}$$
$$= \frac{3 \times 3}{1 \times 2}$$
$$= \frac{9}{2}$$
$$= 4\frac{1}{2}$$

Teaching ideas

3. Using the picture in the book, explain what it means by dividing 2 into $\frac{1}{3}$. There will be 6 groups of $\frac{1}{3}$.
4. Guide them to divide by multiplying the whole number by the reciprocal of the fraction.
5. Use the example to explain further. Remind them to change the dividing sign into multiplying sign and the divisor into its reciprocal.
6. Using the picture in the book, explain what it means by dividing 3 into $\frac{2}{3}$. There will be $4\frac{1}{2}$ groups of $\frac{2}{3}$.
7. Guide them to divide too.

Teaching ideas

8. Using the picture in the book, explain what it means by dividing 4 into $1\frac{1}{2}$. There will be $2\frac{2}{3}$ groups of $1\frac{1}{2}$.
9. Guide them to divide by multiplying the whole number by the reciprocal of the fraction.
10. Use the example to explain further. Remind them to change the dividing sign into multiplying sign and the divisor into its reciprocal.
11. Guide the students to refer to **Starting Point** on page 47. Ask them to answer the questions. Have a discussion to conclude the lesson.



Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 39 and 40 in Go Get Maths Workbook P5.

Activity for Reinforcement

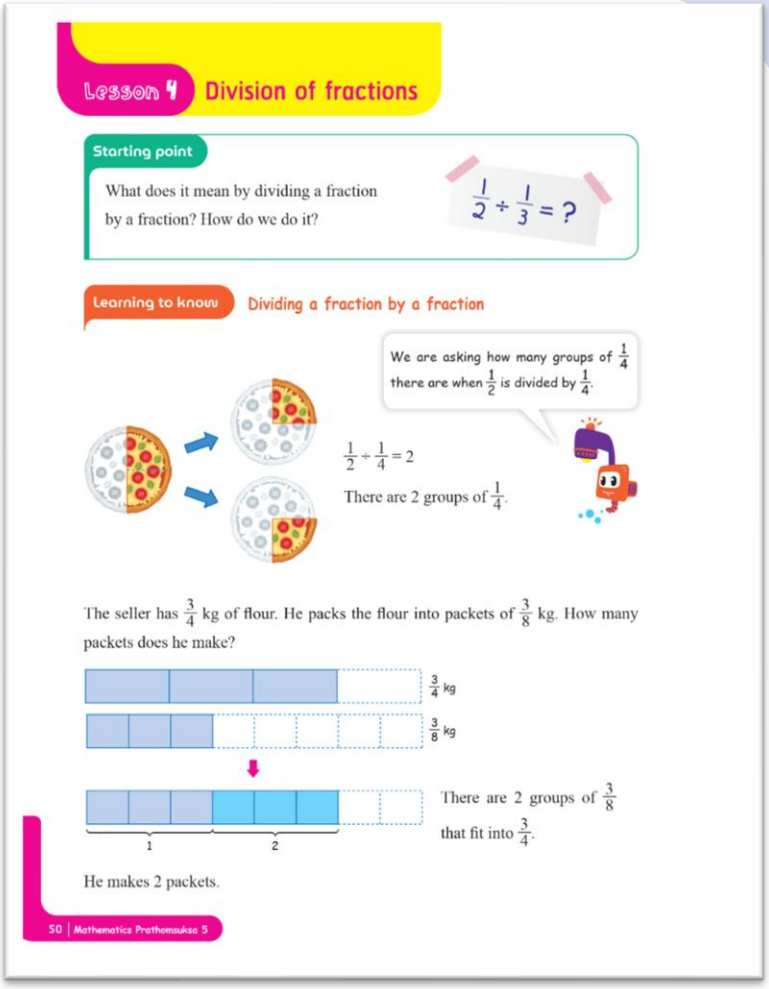
The students need to practice more in order to divide correctly. Get a few students to write these questions on the board and answer them. Get others to verify the answers.

$4 \div \frac{2}{5} = \square$

$6 \div \frac{6}{7} = \square$

$5 \div \frac{15}{11} = \square$

$2 \div 1\frac{1}{4} = \square$



Lesson 4 Division of fractions

Starting point

What does it mean by dividing a fraction by a fraction? How do we do it?

$\frac{1}{2} \div \frac{1}{3} = ?$

Learning to know Dividing a fraction by a fraction

We are asking how many groups of $\frac{1}{4}$ there are when $\frac{1}{2}$ is divided by $\frac{1}{4}$.

$\frac{1}{2} \div \frac{1}{4} = 2$

There are 2 groups of $\frac{1}{4}$.

The seller has $\frac{3}{4}$ kg of flour. He packs the flour into packets of $\frac{3}{8}$ kg. How many packets does he make?

$\frac{3}{4}$ kg

$\frac{3}{8}$ kg

There are 2 groups of $\frac{3}{8}$ that fit into $\frac{3}{4}$.

He makes 2 packets.

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Lesson 4
Division of fractions

Lesson objectives

By the end of the lesson, the students should be able to:

1. Divide a fraction by a fraction.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

Division, reciprocal

Materials needed

Pictures of a half-cut pizza

Starting point

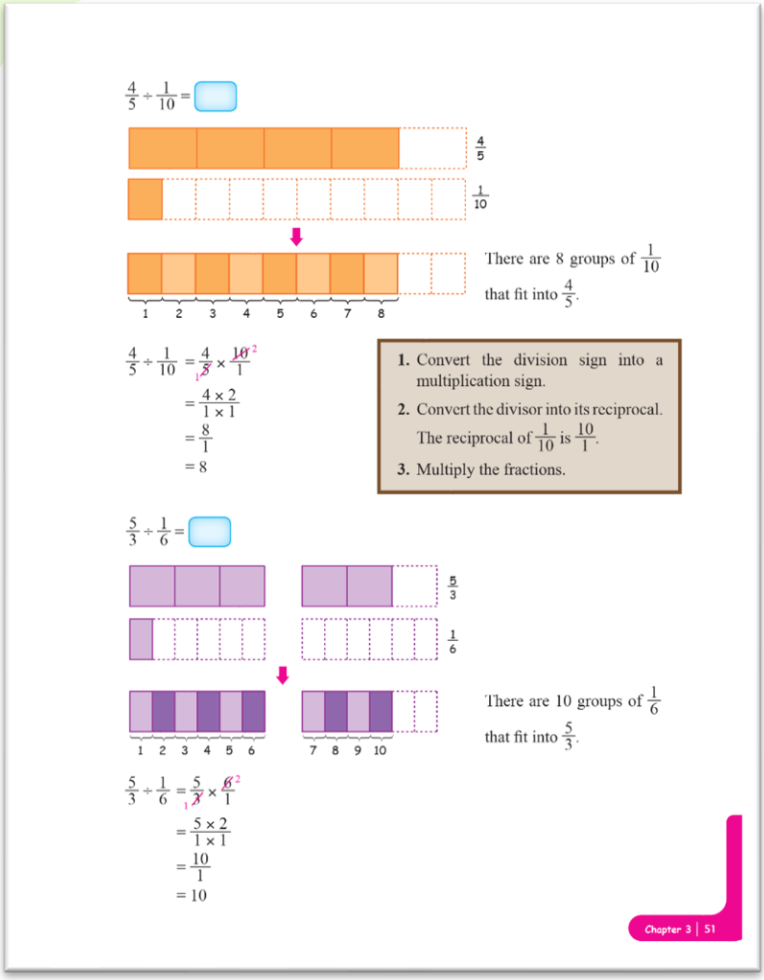
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Show a picture of a half-cut pizza. Ask the students these questions:
   - How do you divide the pizza into $\frac{1}{4}$ of a pizza?
   - How many $\frac{1}{4}$ of a pizza will you get?
2. Guide them to realize that $\frac{1}{2} \div \frac{1}{4} = 2$.
3. Use the next example to guide them to realize that $\frac{3}{4} \div \frac{3}{8} = 2$. Remind them that will be 2 groups of $\frac{3}{8}$.

Teaching ideas

4. Use the next example to guide them to realize that $\frac{4}{5} \div \frac{1}{10} = 8$. Remind them that will be 8 groups of $\frac{1}{10}$.
5. Tell them that they can divide the fractions by multiplying the dividend by the reciprocal of the divisor.
6. Use the example to explain further.
7. Use the next example to guide them to realize that $\frac{5}{3} \div \frac{1}{6} = 10$. Remind them that will be 10 groups of $\frac{1}{6}$. Guide them to do the division.



$\frac{4}{5} \div \frac{1}{10} =$ ☐

$\frac{4}{5}$

$\frac{1}{10}$

1 2 3 4 5 6 7 8

There are 8 groups of $\frac{1}{10}$ that fit into $\frac{4}{5}$.

$\frac{4}{5} \div \frac{1}{10} = \frac{4}{\cancel{5}^{1}} \times \frac{\cancel{10}^{2}}{1}$

$= \frac{4 \times 2}{1 \times 1}$

$= \frac{8}{1}$

$= 8$

1. Convert the division sign into a multiplication sign.
2. Convert the divisor into its reciprocal. The reciprocal of $\frac{1}{10}$ is $\frac{10}{1}$.
3. Multiply the fractions.

$\frac{5}{3} \div \frac{1}{6} =$ ☐

$\frac{5}{3}$

$\frac{1}{6}$

1 2 3 4 5 6 7 8 9 10

There are 10 groups of $\frac{1}{6}$ that fit into $\frac{5}{3}$.

$\frac{5}{3} \div \frac{1}{6} = \frac{5}{\cancel{3}^{1}} \times \frac{\cancel{6}^{2}}{1}$

$= \frac{5 \times 2}{1 \times 1}$

$= \frac{10}{1}$

$= 10$

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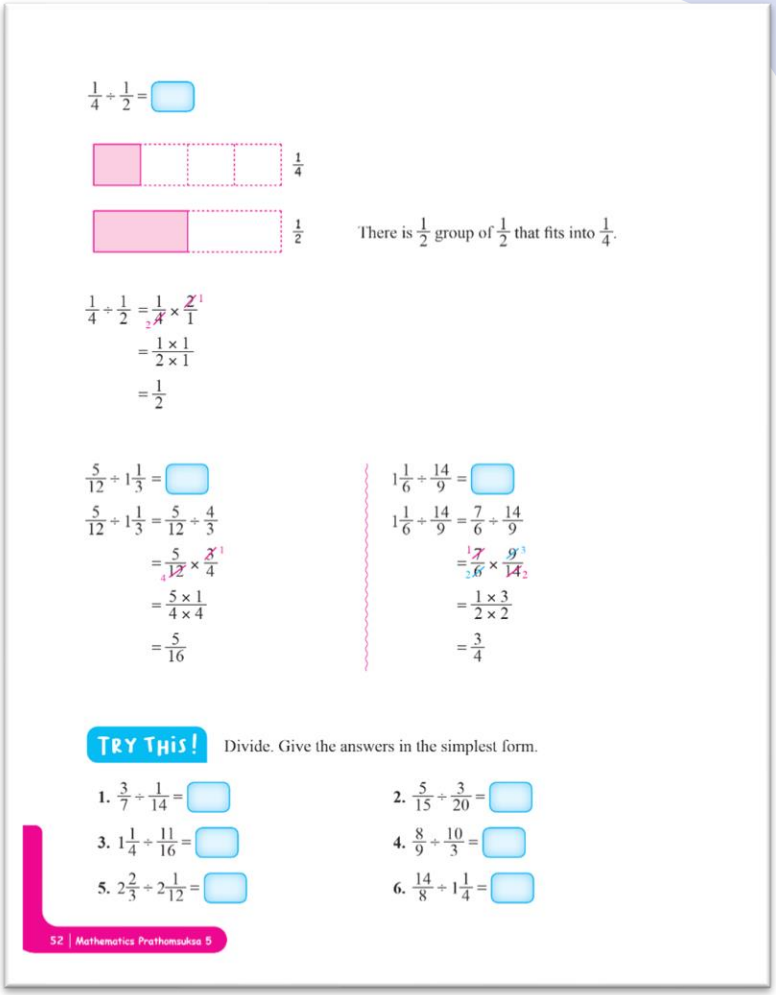
More Info

or visit
http://tiny.cc/o1osuz



$\frac{1}{4} \div \frac{1}{2} = \square$

$\frac{1}{4}$

$\frac{1}{2}$ There is $\frac{1}{2}$ group of $\frac{1}{2}$ that fits into $\frac{1}{4}$.

$\frac{1}{4} \div \frac{1}{2} = \frac{1}{2} \times \frac{2}{1}$

$= \frac{1 \times 1}{2 \times 1}$

$= \frac{1}{2}$

$\frac{5}{12} \div 1\frac{1}{3} = \square$

$\frac{5}{12} \div 1\frac{1}{3} = \frac{5}{12} \div \frac{4}{3}$

$= \frac{5}{12} \times \frac{3}{4}$

$= \frac{5 \times 1}{4 \times 4}$

$= \frac{5}{16}$

$1\frac{1}{6} \div \frac{14}{9} = \square$

$1\frac{1}{6} \div \frac{14}{9} = \frac{7}{6} \div \frac{14}{9}$

$= \frac{7}{6} \times \frac{9}{14}$

$= \frac{1 \times 3}{2 \times 2}$

$= \frac{3}{4}$

TRY THIS! Divide. Give the answers in the simplest form.

1. $\frac{3}{7} \div \frac{1}{14} = \square$
2. $\frac{5}{15} \div \frac{3}{20} = \square$
3. $1\frac{1}{4} \div \frac{11}{16} = \square$
4. $\frac{8}{9} \div \frac{10}{3} = \square$
5. $2\frac{2}{3} \div 2\frac{1}{12} = \square$
6. $\frac{14}{8} \div 1\frac{1}{4} = \square$

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Teaching ideas

8. Use the next example to guide them to realize that $\frac{1}{4} \div \frac{1}{2} = \frac{1}{2}$. Remind them that will be $\frac{1}{2}$ group of $\frac{1}{2}$. Guide them to do the division.
9. Guide them through the examples of division of fractions. Remind them to:
   a) convert the division sign into a multiplication sign
   b) convert the divisor into its reciprocal, before multiplying them.
10. Guide the students to refer to **Starting Point** on page 50. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 41 to 43 in Go Get Maths Workbook P5.

More Info

or visit
http://tiny.cc/w1osuz

More Tasks

or visit
https://wordwall.net/play/33565/790/901

Lesson 5
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving division of fractions.
2. Solve 2-step word problems involving division of fractions.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

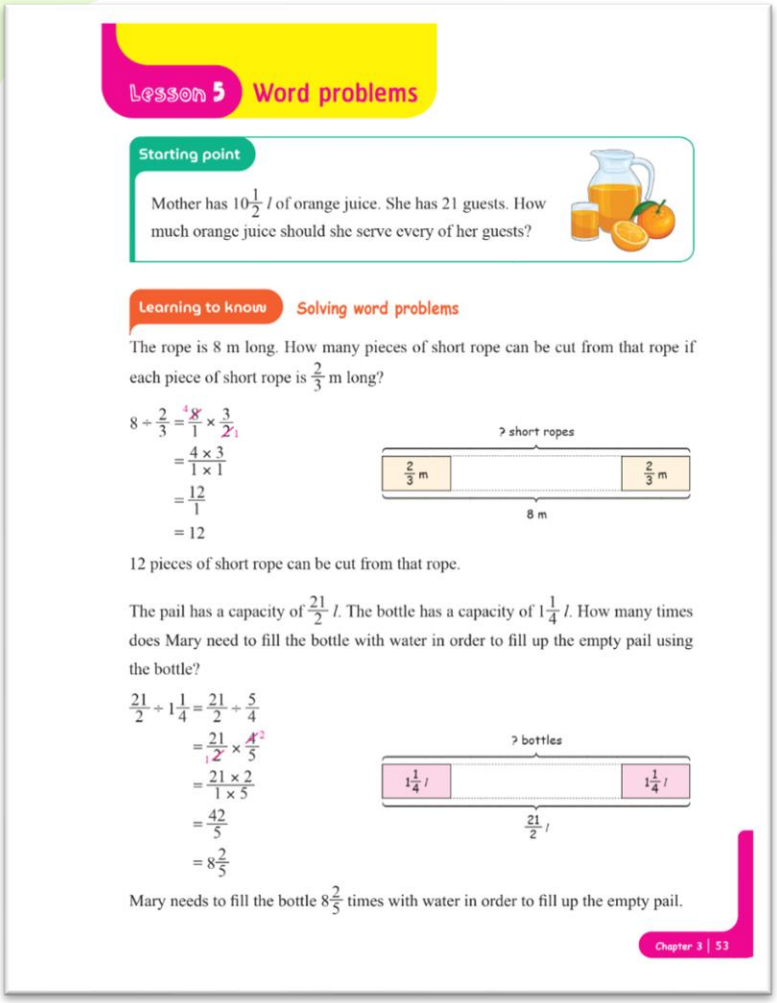
1. Reiterate the 3 simple steps to solve a word problem.

   Step 1: Understand the problem

   Step 2: Plan and execute

   Step 3: Check the answer

2. Work with them the 3 steps in solving the word problems.



Lesson 5 Word problems

Starting point

Mother has $10\frac{1}{2}$ l of orange juice. She has 21 guests. How much orange juice should she serve every of her guests?

Learning to know Solving word problems

The rope is 8 m long. How many pieces of short rope can be cut from that rope if each piece of short rope is $\frac{2}{3}$ m long?

$8 \div \frac{2}{3} = \frac{8}{1} \times \frac{3}{2}$

$= \frac{4 \times 3}{1 \times 1}$

$= \frac{12}{1}$

$= 12$

? short ropes

$\frac{2}{3}$ m $\frac{2}{3}$ m

8 m

12 pieces of short rope can be cut from that rope.

The pail has a capacity of $\frac{21}{2}$ l. The bottle has a capacity of $1\frac{1}{4}$ l. How many times does Mary need to fill the bottle with water in order to fill up the empty pail using the bottle?

$\frac{21}{2} \div 1\frac{1}{4} = \frac{21}{2} \div \frac{5}{4}$

$= \frac{21}{2} \times \frac{4}{5}$

$= \frac{21 \times 2}{1 \times 5}$

$= \frac{42}{5}$

$= 8\frac{2}{5}$

? bottles

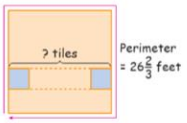
$1\frac{1}{4}$ l $1\frac{1}{4}$ l

$\frac{21}{2}$ l

Mary needs to fill the bottle $8\frac{2}{5}$ times with water in order to fill up the empty pail.

Chapter 3 | 53

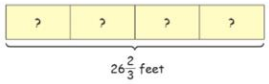
The perimeter of a square room is $26\frac{2}{3}$ feet. The contractor uses square tiles with a length of $1\frac{1}{3}$ feet. How many tiles does he need to make a row of tiles on the floor?



The first step

The perimeter of a square room is $26\frac{2}{3}$ feet. What is the length of the room?

$$26\frac{2}{3} \div 4 = \frac{^{20}\cancel{80}}{3} \times \frac{1}{\cancel{4}_{1}}$$
$$= \frac{20 \times 1}{3 \times 1}$$
$$= \frac{20}{3}$$
$$= 6\frac{2}{3} \text{ feet}$$

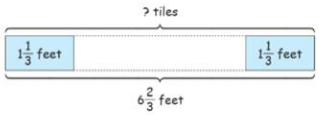


The length of the room is $6\frac{2}{3}$ feet.

The second step

The length of the room is $6\frac{2}{3}$ feet. The contractor uses square tiles with a length of $1\frac{1}{3}$ feet. How many tiles does he need to make a row of tiles on the floor?

$$6\frac{2}{3} \div 1\frac{1}{3} = \frac{20}{3} \div \frac{4}{3}$$
$$= \frac{^{5}\cancel{20}}{\cancel{3}_{1}} \times \frac{\cancel{3}^{1}}{\cancel{4}_{1}}$$
$$= \frac{5 \times 1}{1 \times 1}$$
$$= \frac{5}{1}$$
$$= 5$$



He needs 5 tiles to make a row of tiles on the floor.

Teaching ideas

3. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The perimeter of the square room
   - The length of the square tiles

   b) What do I need to find at the end?
   - The number of tiles to make a row of tiles on the floor

   c) What do I need to find out first?
   - The length of the room

Teaching ideas

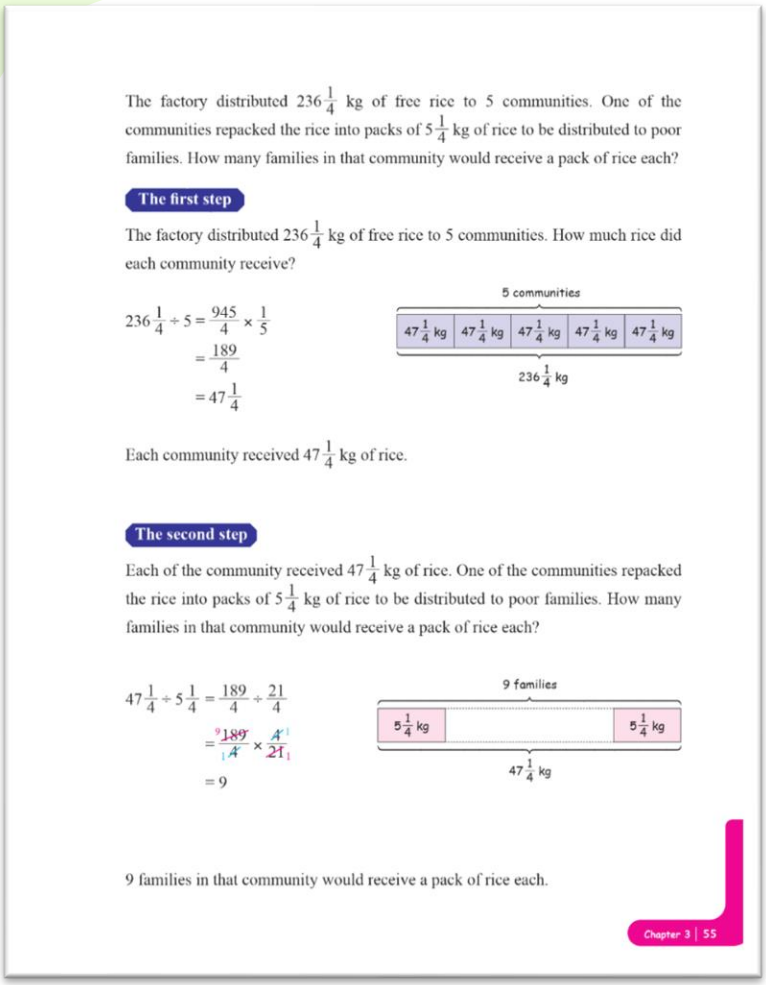
4. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The mass of rice
   - The number of communities

   b) What do I need to find at the end?
   - The number of families in the community

   c) What do I need to find out first?
   - The mass of rice received by a community

5. Guide the students to refer to **Starting Point** on page 53. Ask them to answer the question. Have a discussion to conclude the lesson.



The factory distributed $236\frac{1}{4}$ kg of free rice to 5 communities. One of the communities repacked the rice into packs of $5\frac{1}{4}$ kg of rice to be distributed to poor families. How many families in that community would receive a pack of rice each?

The first step

The factory distributed $236\frac{1}{4}$ kg of free rice to 5 communities. How much rice did each community receive?

$$236\frac{1}{4} \div 5 = \frac{945}{4} \times \frac{1}{5}$$
$$= \frac{189}{4}$$
$$= 47\frac{1}{4}$$

Each community received $47\frac{1}{4}$ kg of rice.

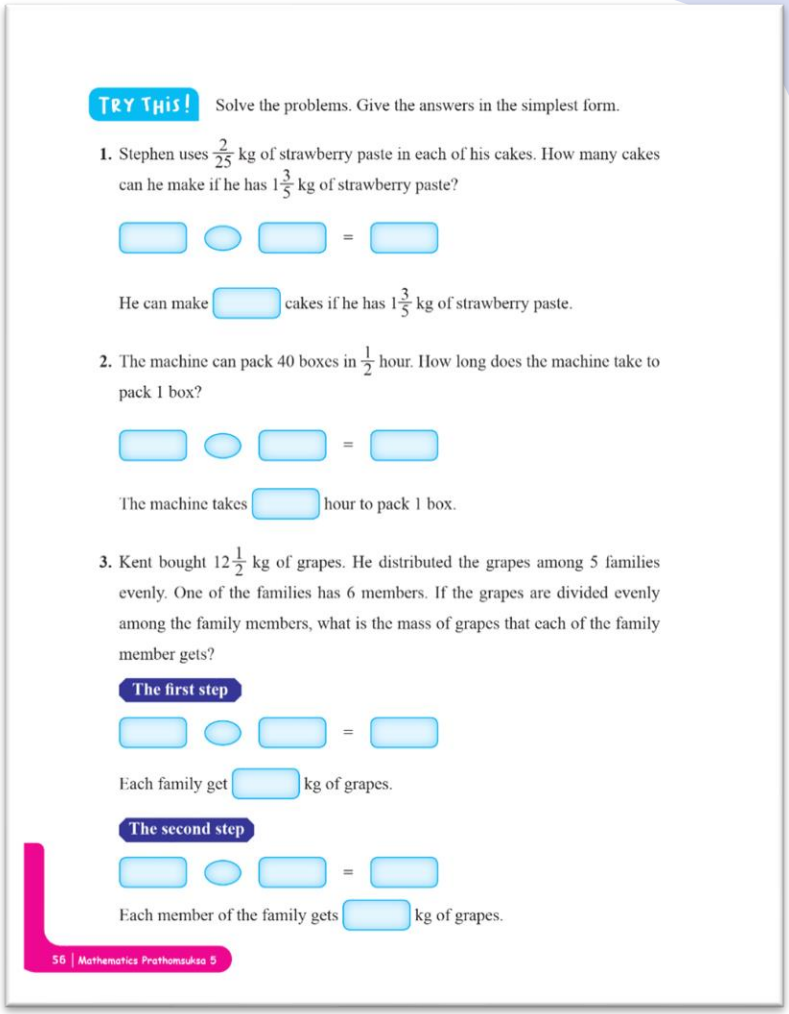
The second step

Each of the community received $47\frac{1}{4}$ kg of rice. One of the communities repacked the rice into packs of $5\frac{1}{4}$ kg of rice to be distributed to poor families. How many families in that community would receive a pack of rice each?

$$47\frac{1}{4} \div 5\frac{1}{4} = \frac{189}{4} \div \frac{21}{4}$$
$$= \frac{{}^{9}\cancel{189}}{\cancel{4}_{1}} \times \frac{\cancel{4}^{1}}{\cancel{21}_{1}}$$
$$= 9$$

9 families in that community would receive a pack of rice each.

Chapter 3 | 55



TRY THIS! Solve the problems. Give the answers in the simplest form.

1. Stephen uses $\frac{2}{25}$ kg of strawberry paste in each of his cakes. How many cakes can he make if he has $1\frac{3}{5}$ kg of strawberry paste?

□ ○ □ = □

He can make □ cakes if he has $1\frac{3}{5}$ kg of strawberry paste.

2. The machine can pack 40 boxes in $\frac{1}{2}$ hour. How long does the machine take to pack 1 box?

□ ○ □ = □

The machine takes □ hour to pack 1 box.

3. Kent bought $12\frac{1}{2}$ kg of grapes. He distributed the grapes among 5 families evenly. One of the families has 6 members. If the grapes are divided evenly among the family members, what is the mass of grapes that each of the family member gets?

The first step

□ ○ □ = □

Each family get □ kg of grapes.

The second step

□ ○ □ = □

Each member of the family gets □ kg of grapes.

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Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 44 to 50 in Go Get Maths Workbook P5.

Chapter 4
Mixed operations of fractions

The big idea

1. Ask the students to look at the picture and read the speech bubble carefully.
2. Ask them these questions to start a discussion:
   - How many pizzas were there at the beginning?
   - What fraction of a pizza did Mike eat?
   - What fraction of a pizza was left?
   - How many people were going to share the pizzas?
   - How do you find the fraction of a pizza that each of the people would get?

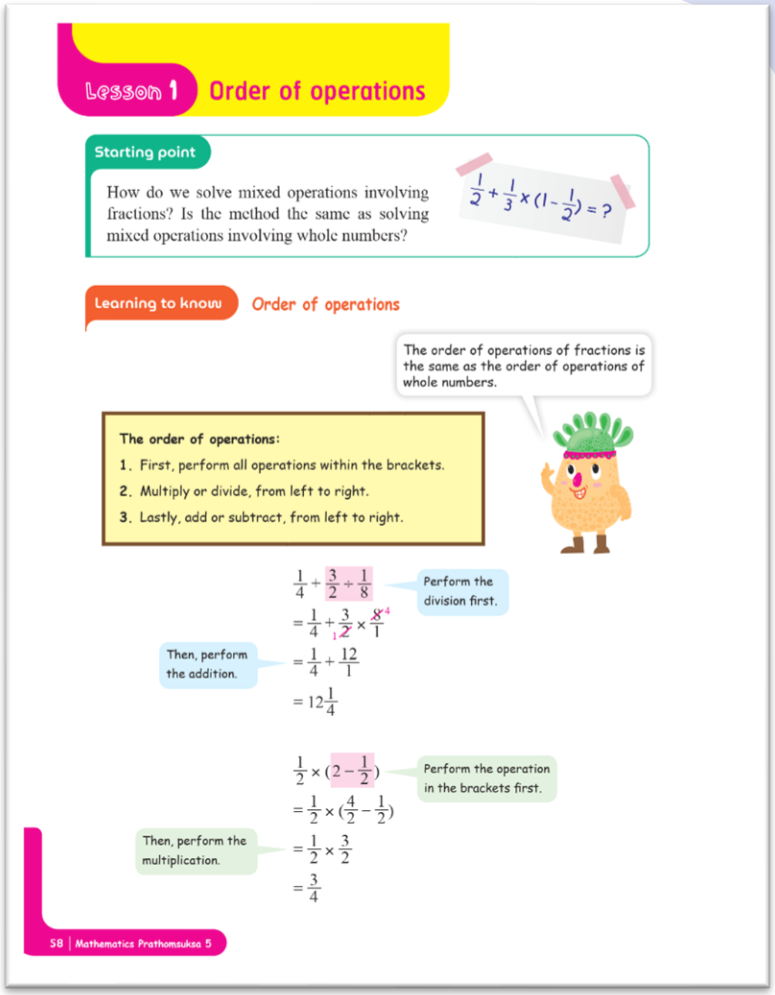
Strand 1: Numbers and algebra

Standard M.1.1 Numbers

Indicators:

M 1.1 Gr5/2 Show mathematical methods of finding answers of word problems using the rule of three in arithmetic.

M 1.1 Gr5/5 Show mathematical methods of finding answers of 2- step word problems of addition, subtraction, multiplication and division.



Lesson 1 Order of operations

Starting point

How do we solve mixed operations involving fractions? Is the method the same as solving mixed operations involving whole numbers?

$\frac{1}{2}+\frac{1}{3}\times(1-\frac{1}{2})=?$

Learning to know Order of operations

The order of operations of fractions is the same as the order of operations of whole numbers.

The order of operations:

1. First, perform all operations within the brackets.
2. Multiply or divide, from left to right.
3. Lastly, add or subtract, from left to right.

$\frac{1}{4}+\frac{3}{2}\div\frac{1}{8}$ Perform the division first.

$=\frac{1}{4}+\frac{3}{\cancel{2}_1}\times\frac{\cancel{8}^4}{1}$

Then, perform the addition. $=\frac{1}{4}+\frac{12}{1}$

$=12\frac{1}{4}$

$\frac{1}{2}\times(2-\frac{1}{2})$ Perform the operation in the brackets first.

$=\frac{1}{2}\times(\frac{4}{2}-\frac{1}{2})$

Then, perform the multiplication. $=\frac{1}{2}\times\frac{3}{2}$

$=\frac{3}{4}$

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Lesson 1 Order of operations

Lesson objectives

By the end of the lesson, the students should be able to:

1. Explain the order of operations.
2. Apply the correct order of operations on problems.

Suggested teaching time

2 periods (2 x 50 minutes)

Vocabulary

Oder of operations

Materials needed

-

Starting point

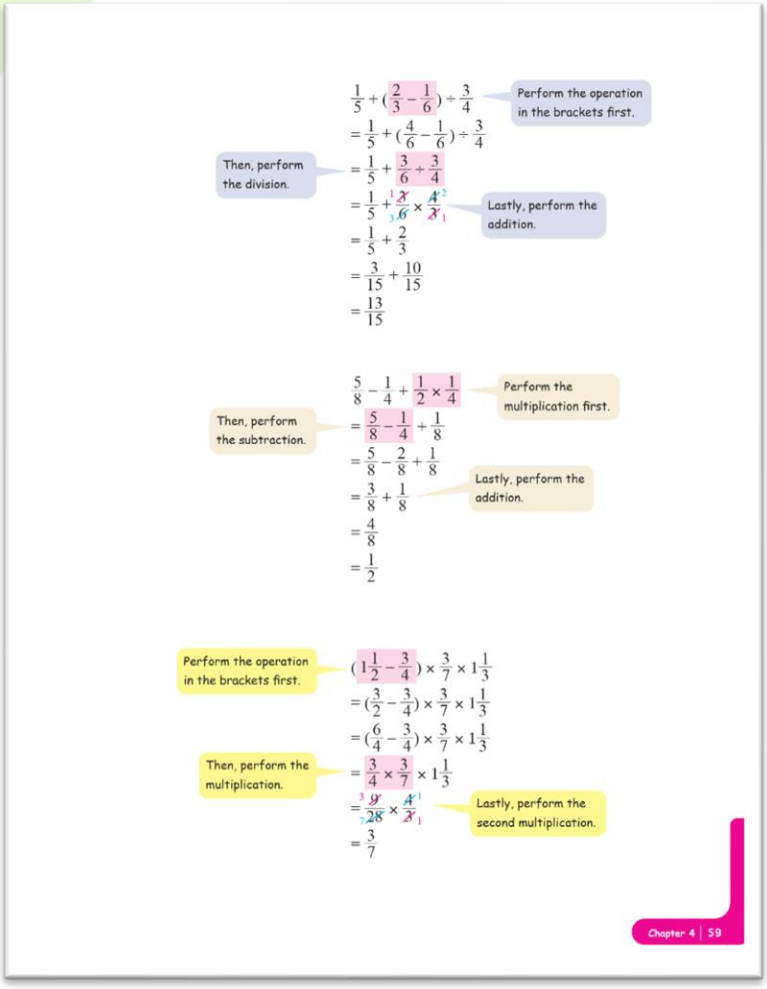
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Ask the students these questions to start a discussion about following orders.
   - What do you do first when you are about to bathe? Then, what do you do next? List the order or sequence.
   - Can you jumble up the order, such as doing the last step first and the first step last?
   - What will happen if you do not follow the necessary order? Will your body be clean?
2. Inform the students that we need to follow some orders when solving mathematical problems even for fractions.

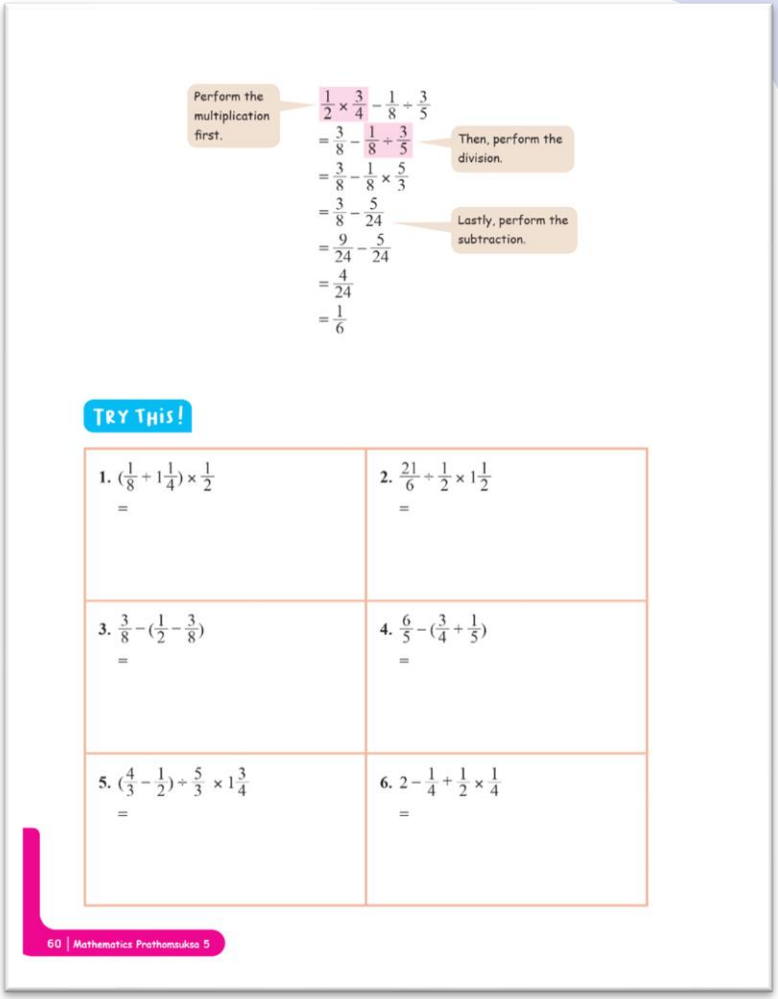
Teaching ideas

3. Help the students to recall the terms of mathematical operations. Inform them the basic mathematical operations are addition, subtraction, multiplication and division.
4. Tell the students that any operations in brackets are the most prioritized. They must do the operations in the brackets first, then followed by multiplication/ division and lastly addition/ subtraction. This applies to fractions too.
5. Inform them that multiplication and division have the same priority. When they have both multiplication and division in the same problem, they should solve them from left to right. This applies to fractions too.
6. This goes the same for addition and subtraction.
7. Use the examples to explain further.



HOTS QS

or visit
http://tiny.cc/p2osuz



Perform the multiplication first.

$\frac{1}{2} \times \frac{3}{4} - \frac{1}{8} \div \frac{3}{5}$

$= \frac{3}{8} - \frac{1}{8} \div \frac{3}{5}$

Then, perform the division.

$= \frac{3}{8} - \frac{1}{8} \times \frac{5}{3}$

$= \frac{3}{8} - \frac{5}{24}$

Lastly, perform the subtraction.

$= \frac{9}{24} - \frac{5}{24}$

$= \frac{4}{24}$

$= \frac{1}{6}$

TRY THIS!

1. $(\frac{1}{8} + 1\frac{1}{4}) \times \frac{1}{2}$ =	2. $\frac{21}{6} \div \frac{1}{2} \times 1\frac{1}{2}$ =
3. $\frac{3}{8} - (\frac{1}{2} - \frac{3}{8})$ =	4. $\frac{6}{5} - (\frac{3}{4} + \frac{1}{5})$ =
5. $(\frac{4}{3} - \frac{1}{2}) \div \frac{5}{3} \times 1\frac{3}{4}$ =	6. $2 - \frac{1}{4} + \frac{1}{2} \times \frac{1}{4}$ =

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or visit
https://wordwall.net/play/33568/445/752

Teaching ideas

8. Use the example to explain further.
9. Guide the students to refer to **Starting Point** on page 58. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

If the students answered wrongly, guide them to identify their mistakes.

Further practices

Get the students to complete the practices on pages 51 and 52 in Go Get Maths Workbook P5.

Lesson 2
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving mixed operations.
2. Solve word problems using the rule of three.

Suggested teaching time

6 periods (4 x 50 minutes)

Vocabulary

Rule of three

Materials needed

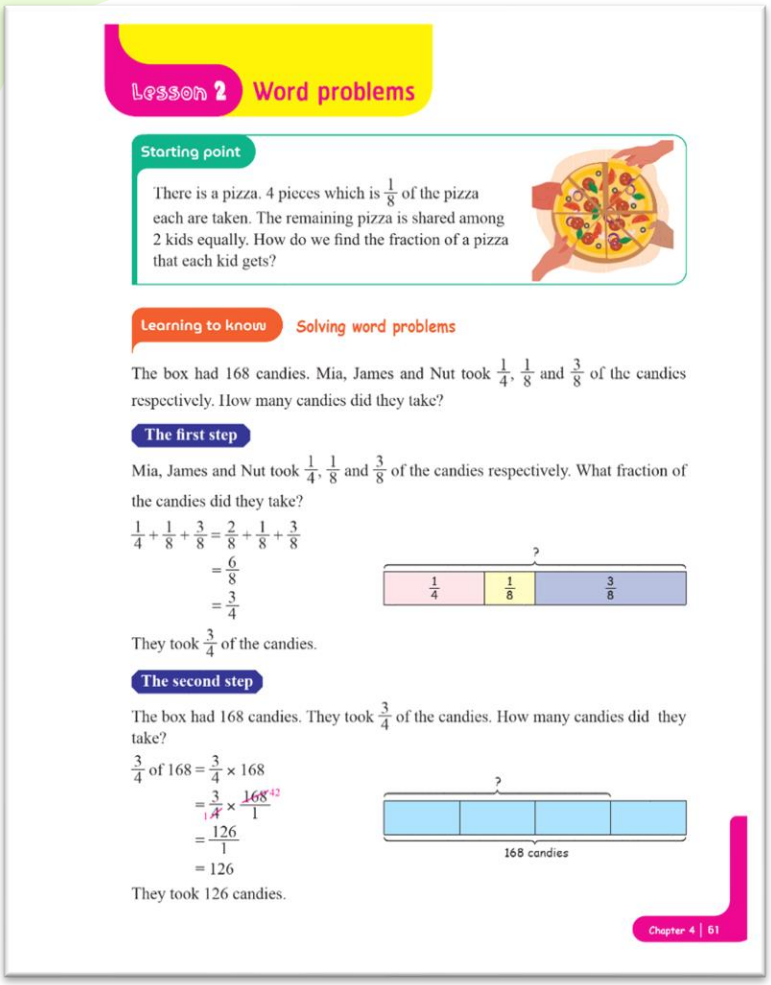
-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Inform the students that these word problems involve 2 steps. They need to understand the number story and the question well.
2. For this example, guide the students to use the 3 steps. Set them thinking about these questions:
   a) What do I know?
      - The number of candies
      - The fraction of the candies that each person took
   b) What do I need to find at the end?
      - The number of candies that they took in total
   c) What do I need to find out first?
      - The fraction of candies that they took in total



Lesson 2 Word problems

Starting point

There is a pizza. 4 pieces which is $\frac{1}{8}$ of the pizza each are taken. The remaining pizza is shared among 2 kids equally. How do we find the fraction of a pizza that each kid gets?

Learning to know Solving word problems

The box had 168 candies. Mia, James and Nut took $\frac{1}{4}$, $\frac{1}{8}$ and $\frac{3}{8}$ of the candies respectively. How many candies did they take?

The first step

Mia, James and Nut took $\frac{1}{4}$, $\frac{1}{8}$ and $\frac{3}{8}$ of the candies respectively. What fraction of the candies did they take?

$\frac{1}{4}+\frac{1}{8}+\frac{3}{8}=\frac{2}{8}+\frac{1}{8}+\frac{3}{8}$

$=\frac{6}{8}$

$=\frac{3}{4}$

They took $\frac{3}{4}$ of the candies.

The second step

The box had 168 candies. They took $\frac{3}{4}$ of the candies. How many candies did they take?

$\frac{3}{4}$ of $168=\frac{3}{4}\times 168$

$=\frac{3}{1}\times\frac{168^{42}}{1}$

$=\frac{126}{1}$

$=126$

They took 126 candies.

Chapter 4 | 61

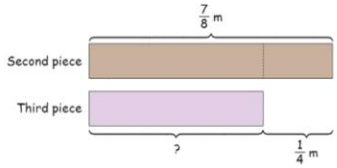
The rope is cut into 3 pieces. The first piece is $1\frac{1}{5}$ m long. The second piece is $\frac{7}{8}$ m long. The second piece is $\frac{1}{4}$ m longer than the third piece. How long was the original rope?

The first step

The second piece is $\frac{7}{8}$ m long. The second piece is $\frac{1}{4}$ m longer than the third piece. How long is the third piece?

$$\frac{7}{8} - \frac{1}{4} = \frac{7}{8} - \frac{2}{8}$$
$$= \frac{5}{8}$$

The third piece is $\frac{5}{8}$ m long.



The second step

The first piece is $1\frac{1}{5}$ m long. The second piece is $\frac{7}{8}$ m long. The third piece is $\frac{5}{8}$ m long. How long was the original rope?

$$1\frac{1}{5} + \frac{7}{8} + \frac{5}{8} = \frac{6}{5} + \frac{7}{8} + \frac{5}{8}$$
$$= \frac{48}{40} + \frac{35}{40} + \frac{25}{40}$$
$$= \frac{108}{40}$$
$$= 2\frac{28}{40}$$
$$= 2\frac{7}{10}$$

The original rope was $2\frac{7}{10}$ m long.

Teaching ideas

3. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The lengths of the first and second pieces of rope
   - The difference in length between the second and the third pieces of rope

   b) What do I need to find at the end?
   - The length of the original rope

   c) What do I need to find out first?
   - The length of the third piece of rope

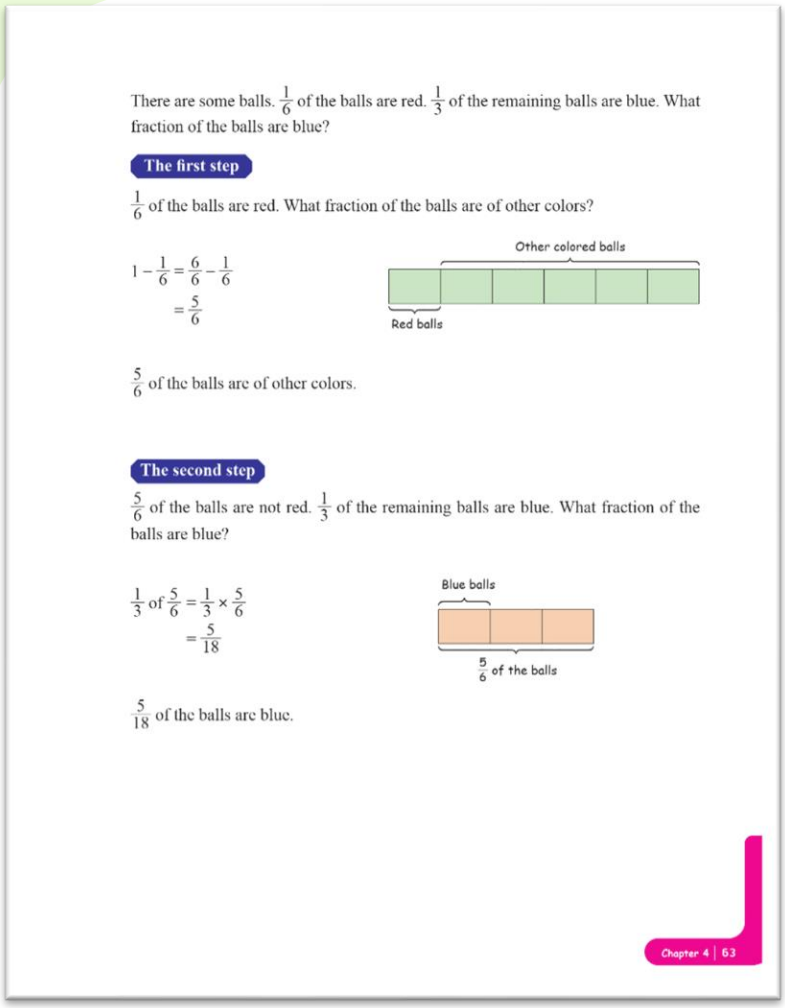
Teaching ideas

4. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The fraction of balls that are red
   - The fraction of the remaining balls that are blue

   b) What do I need to find at the end?
   - The fraction of the balls that are blue

   c) What do I need to find out first?
   - The fraction of the balls that are not red



There are some balls. $\frac{1}{6}$ of the balls are red. $\frac{1}{3}$ of the remaining balls are blue. What fraction of the balls are blue?

The first step

$\frac{1}{6}$ of the balls are red. What fraction of the balls are of other colors?

$1 - \frac{1}{6} = \frac{6}{6} - \frac{1}{6}$

$= \frac{5}{6}$

$\frac{5}{6}$ of the balls are of other colors.

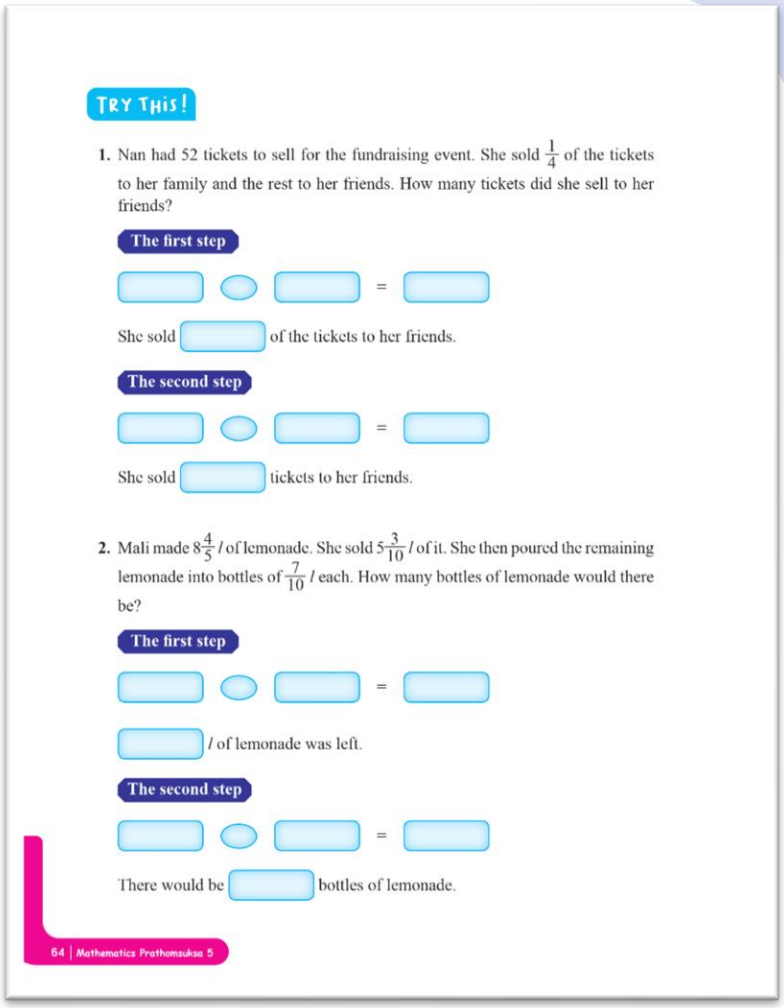
The second step

$\frac{5}{6}$ of the balls are not red. $\frac{1}{3}$ of the remaining balls are blue. What fraction of the balls are blue?

$\frac{1}{3}$ of $\frac{5}{6} = \frac{1}{3} \times \frac{5}{6}$

$= \frac{5}{18}$

$\frac{5}{18}$ of the balls are blue.



TRY THIS!

1. Nan had 52 tickets to sell for the fundraising event. She sold $\frac{1}{4}$ of the tickets to her family and the rest to her friends. How many tickets did she sell to her friends?

The first step

[ ] [ ] [ ] = [ ]

She sold [ ] of the tickets to her friends.

The second step

[ ] [ ] [ ] = [ ]

She sold [ ] tickets to her friends.

2. Mali made $8\frac{4}{5}$ *l* of lemonade. She sold $5\frac{3}{10}$ *l* of it. She then poured the remaining lemonade into bottles of $\frac{7}{10}$ *l* each. How many bottles of lemonade would there be?

The first step

[ ] [ ] [ ] = [ ]

[ ] *l* of lemonade was left.

The second step

[ ] [ ] [ ] = [ ]

There would be [ ] bottles of lemonade.

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Try This!

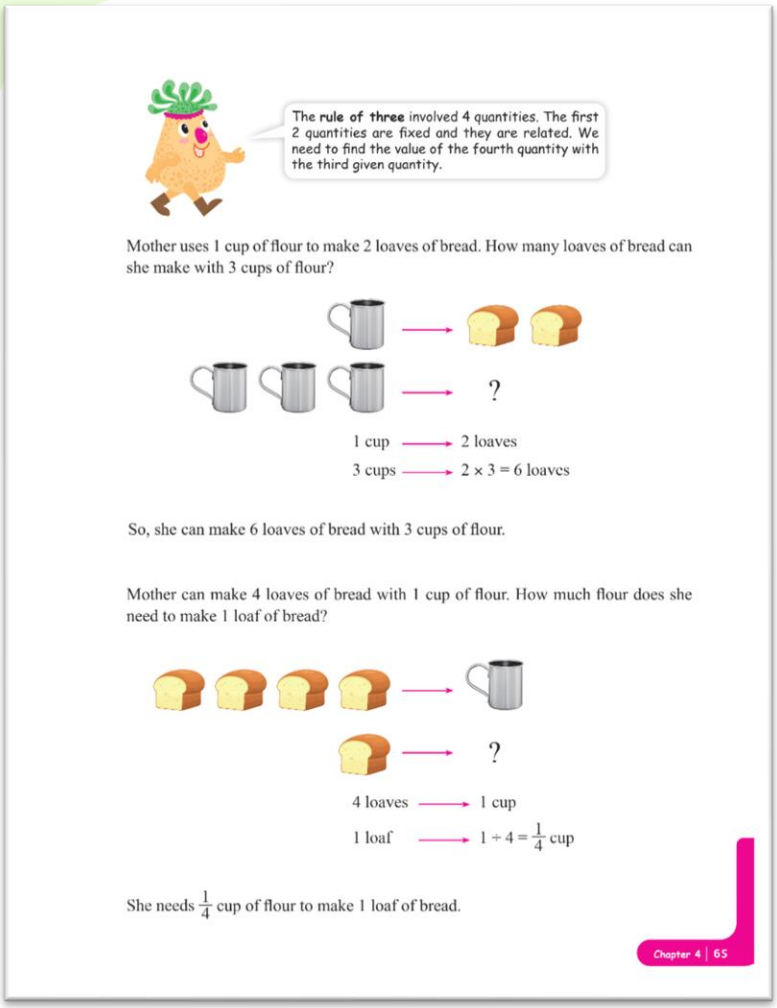
Get 2 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 53 to 58 in Go Get Maths Workbook P5.

Teaching ideas

1. Explain what is *rule of three*. Inform the students that the first and second quantities are given and related. We need to find the fourth quantity with the third quantity.
2. Using the example that 1 cup of flour is needed to make 2 loaves of bread, ask the students
   a) how to find the number of loaves of bread can be made with 2 cups of flour. Do they use addition to find the answer?
   b) how to find the number of loaves of bread can be made with 3 cups of flour. Do they use addition to find the answer? Can they use multiplication?
   c) how to find the number of loaves of bread can be made with 12 cups of flour. Is it easier to use multiplication?
3. Use the calcultion to explain further.
4. Using the example that to make 4 loaves of bread, 1 cup of flour is needed, ask the students
   a) how to find the number of cups of flour to make 1 loaf of bread.
   b) Do they use division to find the answer? Why is not addition or multiplication?
5. Use the calculation to explain further.



The **rule of three** involved 4 quantities. The first 2 quantities are fixed and they are related. We need to find the value of the fourth quantity with the third given quantity.

Mother uses 1 cup of flour to make 2 loaves of bread. How many loaves of bread can she make with 3 cups of flour?

1 cup → 2 loaves

3 cups → $2 \times 3 = 6$ loaves

So, she can make 6 loaves of bread with 3 cups of flour.

Mother can make 4 loaves of bread with 1 cup of flour. How much flour does she need to make 1 loaf of bread?

4 loaves → 1 cup

1 loaf → $1 \div 4 = \frac{1}{4}$ cup

She needs $\frac{1}{4}$ cup of flour to make 1 loaf of bread.

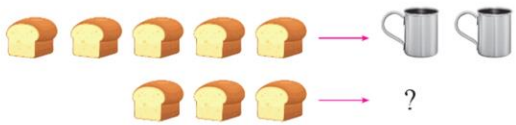
Chapter 4 | 65

Activity for Reinforcement

Introduce some more examples to reinforce the students' understanding of the rule of three. Here is an example.

1. Draw 2 cakes and 3 eggs. Tell the students that to bake 2 cakes, 3 eggs are needed. Ask them these questions:
   a) How many eggs are needed to make 1 cake?
   b) How many eggs are needed to make 3 cakes?
2. Draw 3 cakes and 7 eggs. Tell the students that to bake 3 cakes, 7 eggs are needed. Ask them these questions:
   a) How many eggs are needed to make 1 cake?
   b) How many eggs are needed to make 5 cakes?

Mother can make 5 loaves of bread with 2 cups of flour. How much flour does she need to make 3 loaves of bread?



5 loaves → 2 cups

1 loaf → $2 \div 5 = \frac{2}{5}$ cup

3 loaves → $\frac{2}{5} \times 3 = \frac{6}{5}$

$= 1\frac{1}{5}$ cups

She needs $1\frac{1}{5}$ cups of flour to make 3 loaves of bread.

3 cm on the map represents $\frac{1}{2}$ km in reality. The hotel is 7 cm away from the bus station on the map. How far is the hotel from the bus station in reality?

3 cm → $\frac{1}{2}$ km

1 cm → $\frac{1}{2} \div 3 = \frac{1}{2} \times \frac{1}{3}$

$= \frac{1}{6}$ km

7 cm → $\frac{1}{6} \times 7 = \frac{7}{6}$

$= 1\frac{1}{6}$ km

The hotel is $1\frac{1}{6}$ km from the bus station in reality.

Teaching ideas

6. Using the example that to make 5 loaves of bread, 2 cups of flour is needed, ask the students how to find the number of cups of flour to make 3 loaves of bread. Can they find the answer directly?
7. Guide them to realize that they need to find the number of cups of flour to make 1 loaf of bread first. Emphasize that we need to know this before we can find the number of cups of flour to make other numbers of loaves of bread first.
8. Use the next example to explain further. Guide them to find the first and second quantities that are related and identify the third quantity.

Teaching ideas

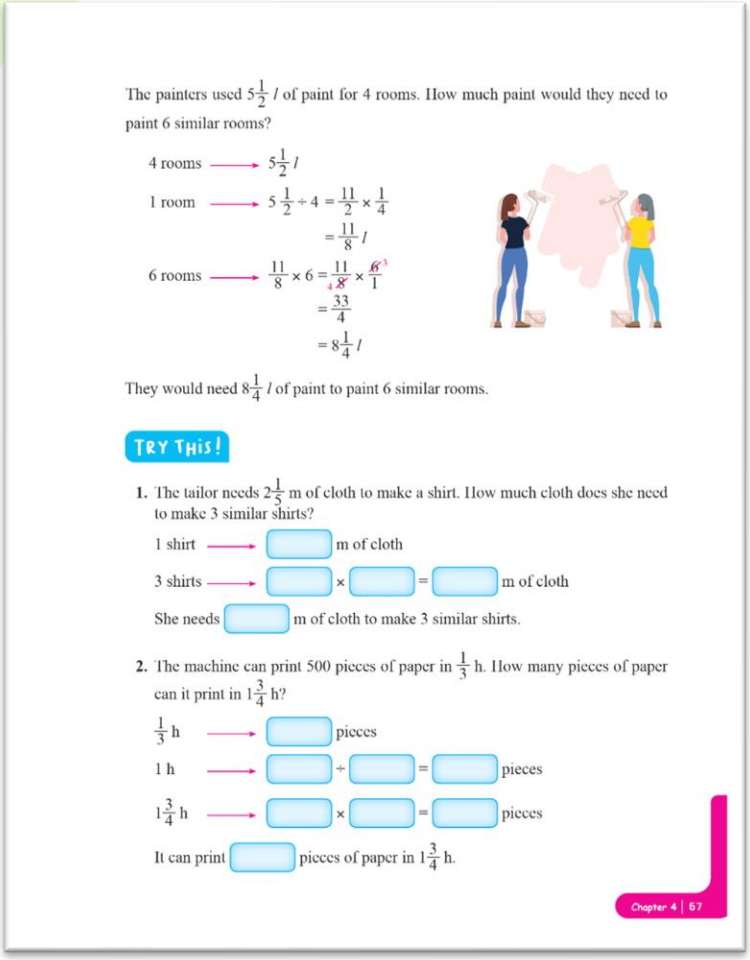
9. Use the example to explain further. Guide them to find the first and second quantities that are related and identify the third quantity.
10. Guide the students to refer to **Starting Point** on page 61. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 2 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 59 to 61 in Go Get Maths Workbook P5.



The painters used $5\frac{1}{2}$ *l* of paint for 4 rooms. How much paint would they need to paint 6 similar rooms?

4 rooms → $5\frac{1}{2}$ *l*

1 room → $5\frac{1}{2} \div 4 = \frac{11}{2} \times \frac{1}{4}$

$= \frac{11}{8}$ *l*

6 rooms → $\frac{11}{8} \times 6 = \frac{11}{4} \times \frac{6^3}{1}$

$= \frac{33}{4}$

$= 8\frac{1}{4}$ *l*

They would need $8\frac{1}{4}$ *l* of paint to paint 6 similar rooms.

TRY THIS!

1. The tailor needs $2\frac{1}{5}$ m of cloth to make a shirt. How much cloth does she need to make 3 similar shirts?

1 shirt → ☐ m of cloth

3 shirts → ☐ × ☐ = ☐ m of cloth

She needs ☐ m of cloth to make 3 similar shirts.

2. The machine can print 500 pieces of paper in $\frac{1}{3}$ h. How many pieces of paper can it print in $1\frac{3}{4}$ h?

$\frac{1}{3}$ h → ☐ pieces

1 h → ☐ ÷ ☐ = ☐ pieces

$1\frac{3}{4}$ h → ☐ × ☐ = ☐ pieces

It can print ☐ pieces of paper in $1\frac{3}{4}$ h.

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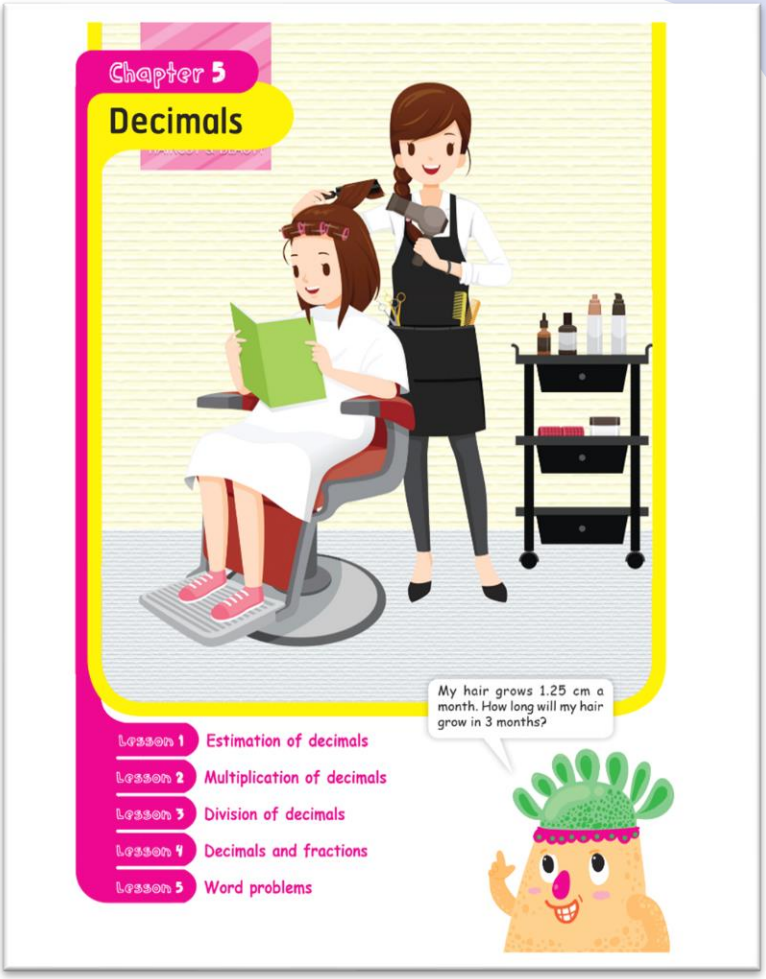


Chapter 5 Decimals

The big idea

Ask the students to look at the picture carefully. Ask them these questions to start a discussion:

a) How often do you comb your hair?

b) Do you realize that your hair grows?

c) How fast does it grow?

d) How often do you have a haircut?

e) How long does it grow in a month?

f) If it grows 1.25 cm in a month, how long does it grow in 3 months?

Strand 1: Numbers and Algebra

Standard M.1.1 Numbers

Indicators:

M 1.1 Gr5/1 Write fractions that the denominators are the factor of 10 or 100 or 1,000 in decimals.

M 1.1 Gr5/6 Find the products of multiplying decimals with not more than three decimal places.

M 1.1 Gr5/7 Find the products of dividing decimals not more than 3 decimal places with denominations are cardinal numbers or decimals not more than 3 decimal places and divisors are cardinal numbers.

M 1.1 Gr5/8 Show mathematical methods of finding answers of 2- step decimal word problems of addition, subtraction, multiplication and division

Lesson 1
Estimation of decimals

Lesson objectives
By the end of the lesson, the students should be able to:

1. Estimate decimals with not more than 3 decimal places to the nearest whole number, tenth and hundredth.
2. Estimate sums and differences.

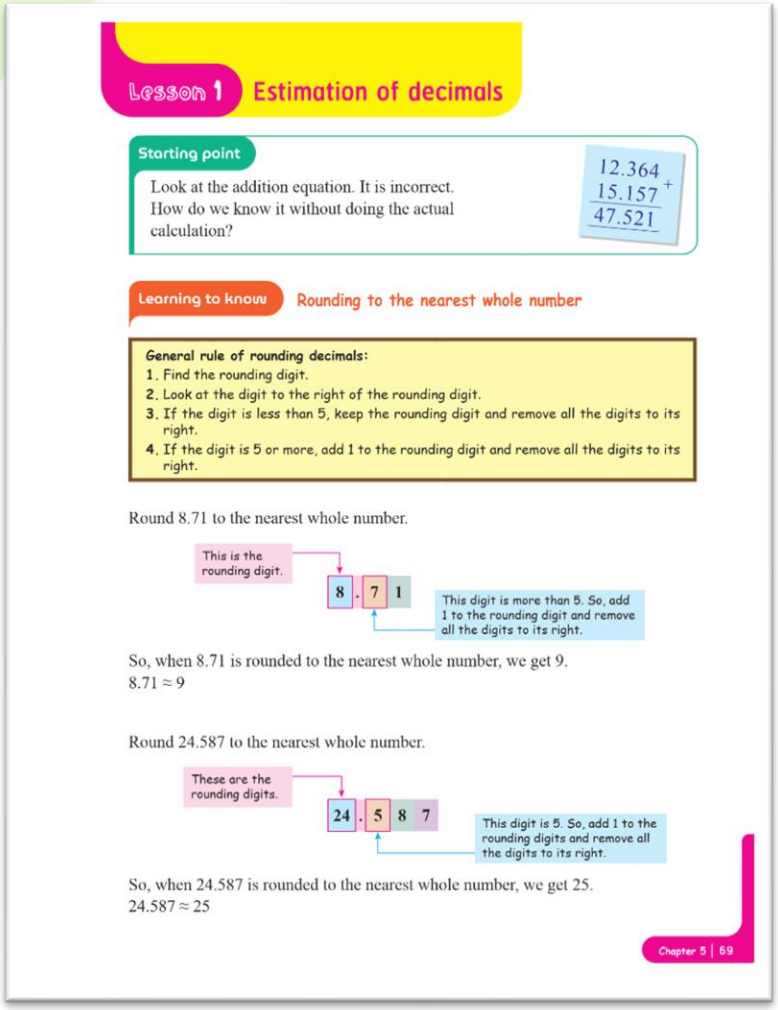
Suggested teaching time
3 periods (3 x 50 minutes)

Vocabulary
Estimation, nearest, decimal, rounding, decimal place

Materials needed
-

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Help the students to recall what rounding of 18 to the nearest ten mean. Which ten is nearest to 18, 10 or 20? Ask them to proof it.
2. Help them to recall how to round a number to ten without drawing the line number but by analyzing the digit in the ones place. Repeat with rounding a number to the nearest hundred and thousand.
3. Guide them to round a decimal to the nearest whole number. Help them to identify the rounding digit and the digit to the right of the rounding digit.



Lesson 1 Estimation of decimals

Starting point

Look at the addition equation. It is incorrect. How do we know it without doing the actual calculation?

12.364
15.157 +
47.521

Learning to know Rounding to the nearest whole number

General rule of rounding decimals:
1. Find the rounding digit.
2. Look at the digit to the right of the rounding digit.
3. If the digit is less than 5, keep the rounding digit and remove all the digits to its right.
4. If the digit is 5 or more, add 1 to the rounding digit and remove all the digits to its right.

Round 8.71 to the nearest whole number.

This is the rounding digit. 8 . 7 1 This digit is more than 5. So, add 1 to the rounding digit and remove all the digits to its right.

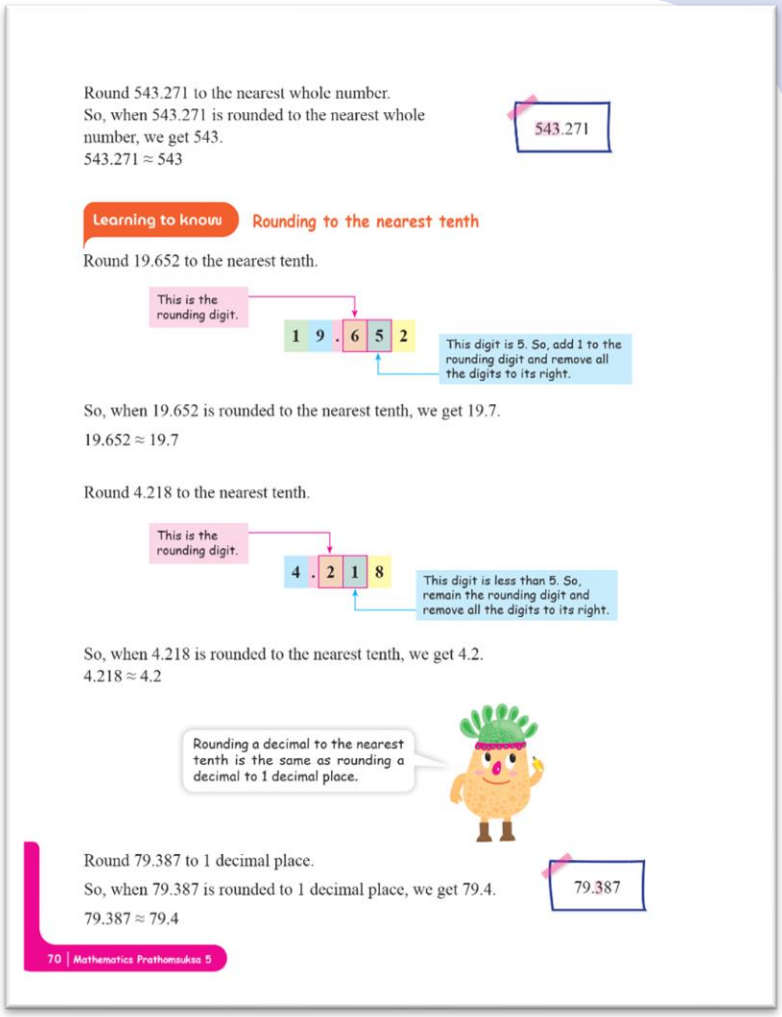
So, when 8.71 is rounded to the nearest whole number, we get 9.
$8.71 \approx 9$

Round 24.587 to the nearest whole number.

These are the rounding digits. 24 . 5 8 7 This digit is 5. So, add 1 to the rounding digits and remove all the digits to its right.

So, when 24.587 is rounded to the nearest whole number, we get 25.
$24.587 \approx 25$

Chapter 5 | 69



Round 543.271 to the nearest whole number.
So, when 543.271 is rounded to the nearest whole number, we get 543.
$543.271 \approx 543$

543.271

Learning to know Rounding to the nearest tenth

Round 19.652 to the nearest tenth.

This is the rounding digit.

1 9 . 6 5 2

This digit is 5. So, add 1 to the rounding digit and remove all the digits to its right.

So, when 19.652 is rounded to the nearest tenth, we get 19.7.
$19.652 \approx 19.7$

Round 4.218 to the nearest tenth.

This is the rounding digit.

4 . 2 1 8

This digit is less than 5. So, remain the rounding digit and remove all the digits to its right.

So, when 4.218 is rounded to the nearest tenth, we get 4.2.
$4.218 \approx 4.2$

Rounding a decimal to the nearest tenth is the same as rounding a decimal to 1 decimal place.

Round 79.387 to 1 decimal place.
So, when 79.387 is rounded to 1 decimal place, we get 79.4.
$79.387 \approx 79.4$

79.387

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Teaching ideas

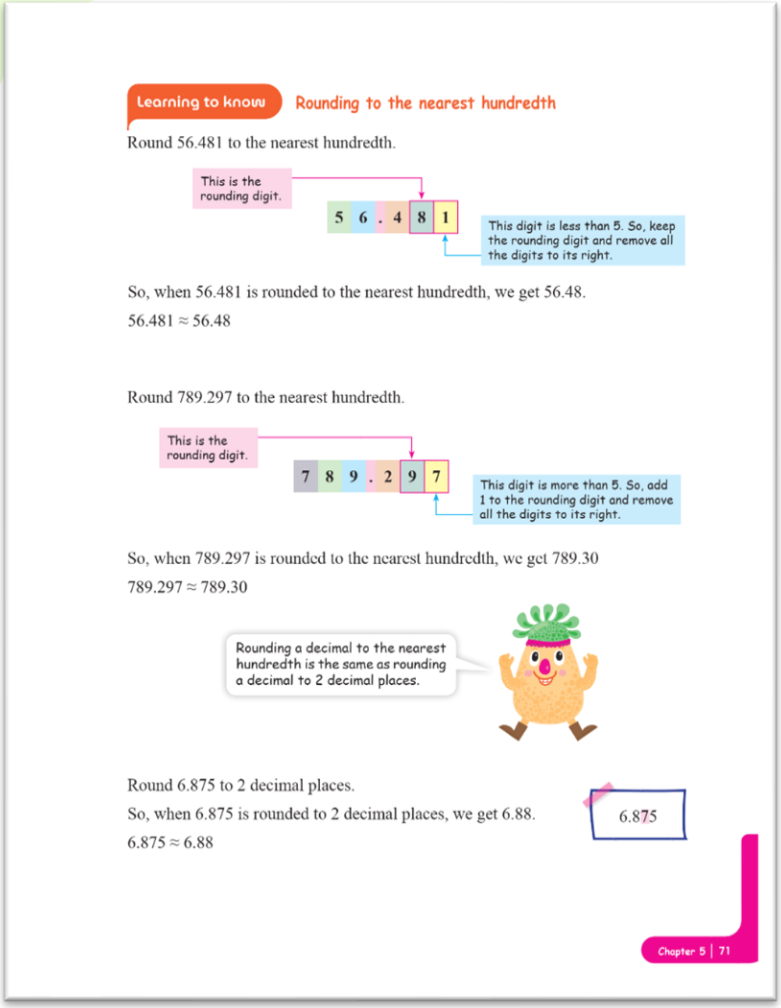
4. Repeat with the example.

Teaching ideas

1. Tell the students that we can round a decimal to the nearest tenth. This means we need to find which tenth it is nearest to.
2. For the first example, to round 19.652 to the nearest tenth, help them to identify the rounding digit (6) and the digit to the right of the rounding digit (5). Ask them if they should keep the rounding digit or add 1 to it. What happens to the digits on the right of the rounding digit?
3. Repeat with 4.218 and 79.387.
4. Guide the students to understand that decimals with 1 decimal place have whole numbers and a digit in the tenths place.

Teaching ideas

1. Tell the students that we can round a decimal to the nearest hundredth. This means we need to find which hundredth it is nearest to.
2. For the first example, to round 56.481 to the nearest hundredth, help them to identify the rounding digit (8) and the digit to the right of the rounding digit (1). Ask them if they should keep the rounding digit or add 1 to it. What happens to the digits on the right of the rounding digit?
3. Repeat with 789.297 and 6.875.
4. Guide the students to understand that decimals with 2 decimal places have whole numbers and digits in the tenths and hundredths places.



Learning to know Rounding to the nearest hundredth

Round 56.481 to the nearest hundredth.

This is the rounding digit.

5 6 . 4 8 1

This digit is less than 5. So, keep the rounding digit and remove all the digits to its right.

So, when 56.481 is rounded to the nearest hundredth, we get 56.48.

$56.481 \approx 56.48$

Round 789.297 to the nearest hundredth.

This is the rounding digit.

7 8 9 . 2 9 7

This digit is more than 5. So, add 1 to the rounding digit and remove all the digits to its right.

So, when 789.297 is rounded to the nearest hundredth, we get 789.30

$789.297 \approx 789.30$

Rounding a decimal to the nearest hundredth is the same as rounding a decimal to 2 decimal places.

Round 6.875 to 2 decimal places.

So, when 6.875 is rounded to 2 decimal places, we get 6.88.

$6.875 \approx 6.88$

6.875

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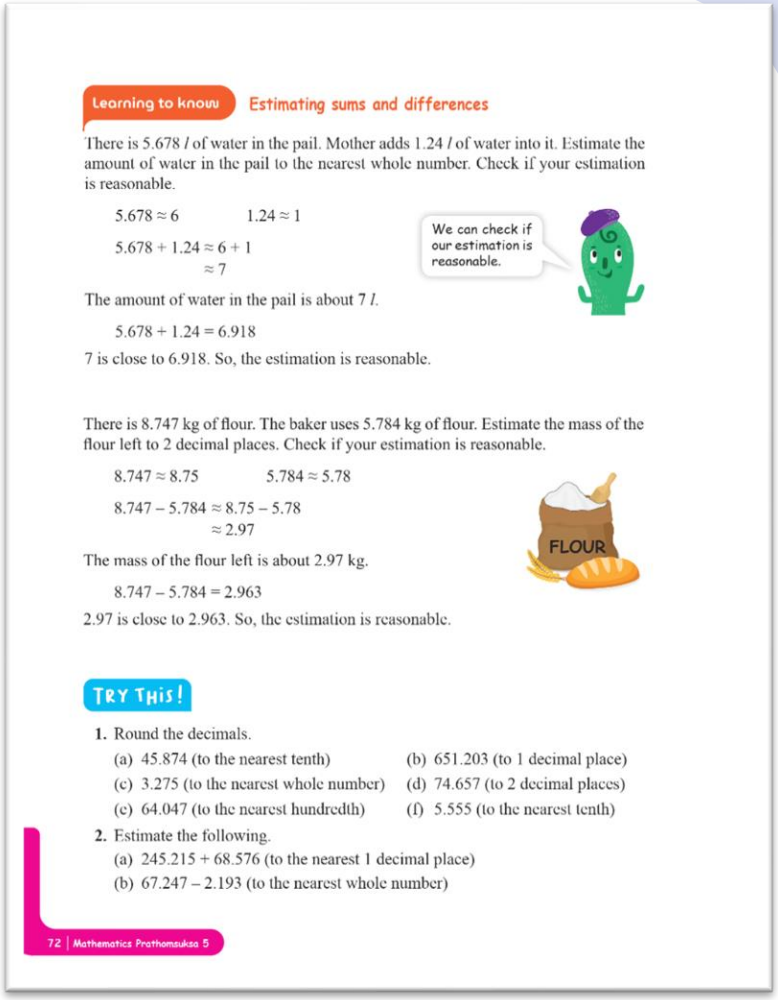
More Tasks

or visit
https://wordwall.net/play/33659/155/556



Learning to know **Estimating sums and differences**

There is 5.678 *l* of water in the pail. Mother adds 1.24 *l* of water into it. Estimate the amount of water in the pail to the nearest whole number. Check if your estimation is reasonable.

$5.678 \approx 6$ $\quad 1.24 \approx 1$

$5.678 + 1.24 \approx 6 + 1$

≈ 7

We can check if our estimation is reasonable.

The amount of water in the pail is about 7 *l*.

$5.678 + 1.24 = 6.918$

7 is close to 6.918. So, the estimation is reasonable.

There is 8.747 kg of flour. The baker uses 5.784 kg of flour. Estimate the mass of the flour left to 2 decimal places. Check if your estimation is reasonable.

$8.747 \approx 8.75$ $\quad 5.784 \approx 5.78$

$8.747 - 5.784 \approx 8.75 - 5.78$

≈ 2.97

FLOUR

The mass of the flour left is about 2.97 kg.

$8.747 - 5.784 = 2.963$

2.97 is close to 2.963. So, the estimation is reasonable.

TRY THIS!

1. Round the decimals.
   (a) 45.874 (to the nearest tenth)
   (b) 651.203 (to 1 decimal place)
   (c) 3.275 (to the nearest whole number)
   (d) 74.657 (to 2 decimal places)
   (e) 64.047 (to the nearest hundredth)
   (f) 5.555 (to the nearest tenth)
2. Estimate the following.
   (a) 245.215 + 68.576 (to the nearest 1 decimal place)
   (b) 67.247 – 2.193 (to the nearest whole number)

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Activity for Reinforcement

Use the following scenarios to show how estimation can be used in our daily life. Discuss with them each scenario.

1. An apple costs 18 Baht. When Mimi buys 5 apples, the cashier asks for 120 Baht. Is it right? Why?
2. Mother needs 36 cm of a ribbon to tie a present. She has 8 similar presents. Which ribbon should she buy with minimum wastage, 3-m ribbon or 4-m ribbon? Why?
3. A 3-kg pack of rice has a price tag of 130 Baht. A 8-kg pack of rice has a price tag of 230 Baht. Which is a better bargain? Why?

Teaching ideas

1. Tell the students that we can estimate sums or differences by rounding the numbers before adding or subtracting.
2. Use the examples to explain further.
3. Guide the students to refer to **Starting Point** on page 69. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 8 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 62 to 64 in Go Get Maths Workbook P5.

Lesson 2
Multiplication of decimals

Lesson objectives
By the end of the lesson, the students should be able to:

1. Multiply a decimal by a whole number.
2. Multiply a decimal by 10, 100, 1,000 and their multiples.
3. Multiply a decimal by a decimal.

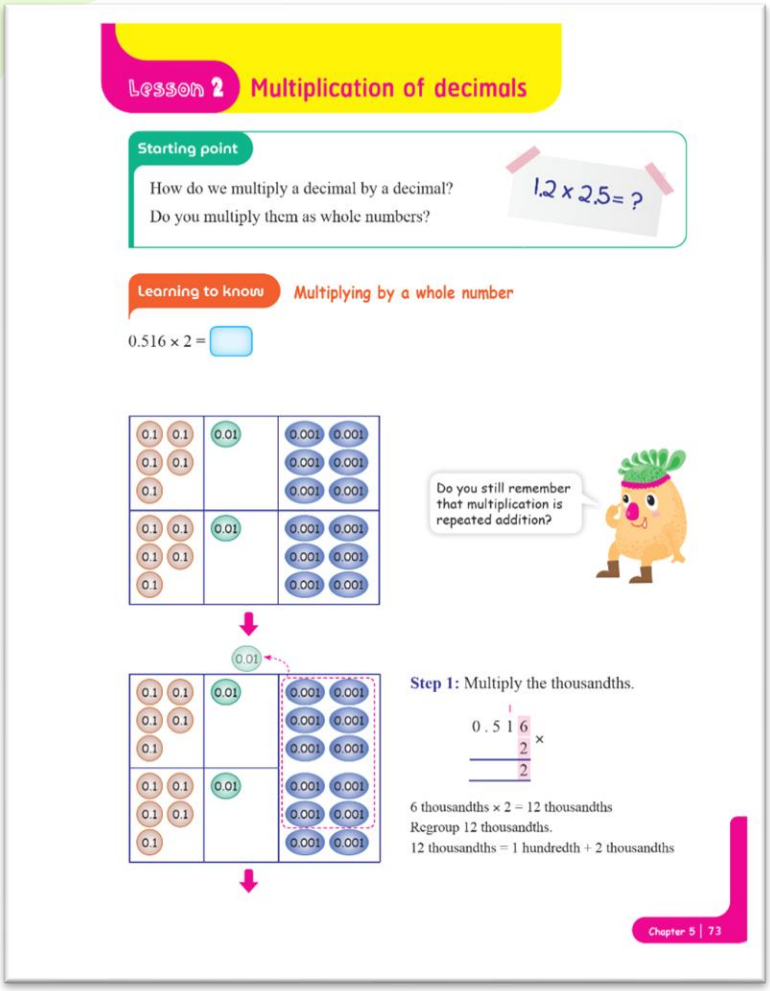
Suggested teaching time
4 periods (4 x 50 minutes)

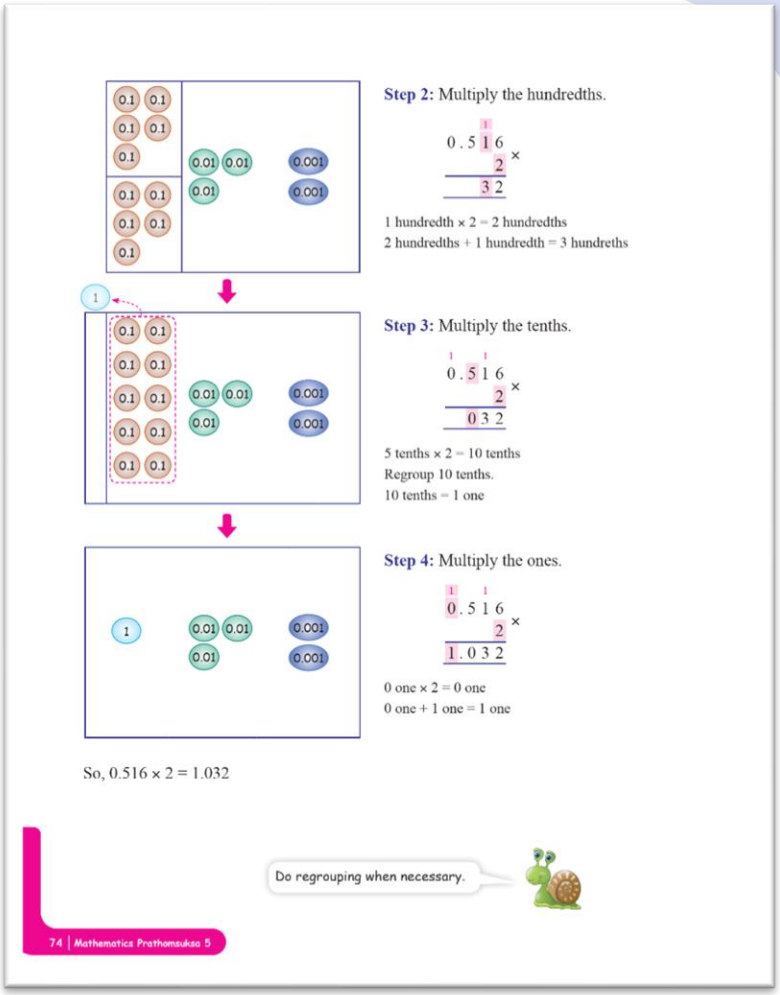
Vocabulary
Multiplication, regrouping

Materials needed
Number discs, decimal discs, paper

Starting point
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas
1. Help the students to recall the multiplication tables by asking them to recite the tables.
2. Write 0.516 x 2 on the board. Guide them to multiply using decimal discs.
3. Give some decimal discs to 2 students and ask them to use the discs to represent 0.516.
4. Then, ask them to add up the 0.001 discs. Are they more than 10 discs? Should they regroup them?



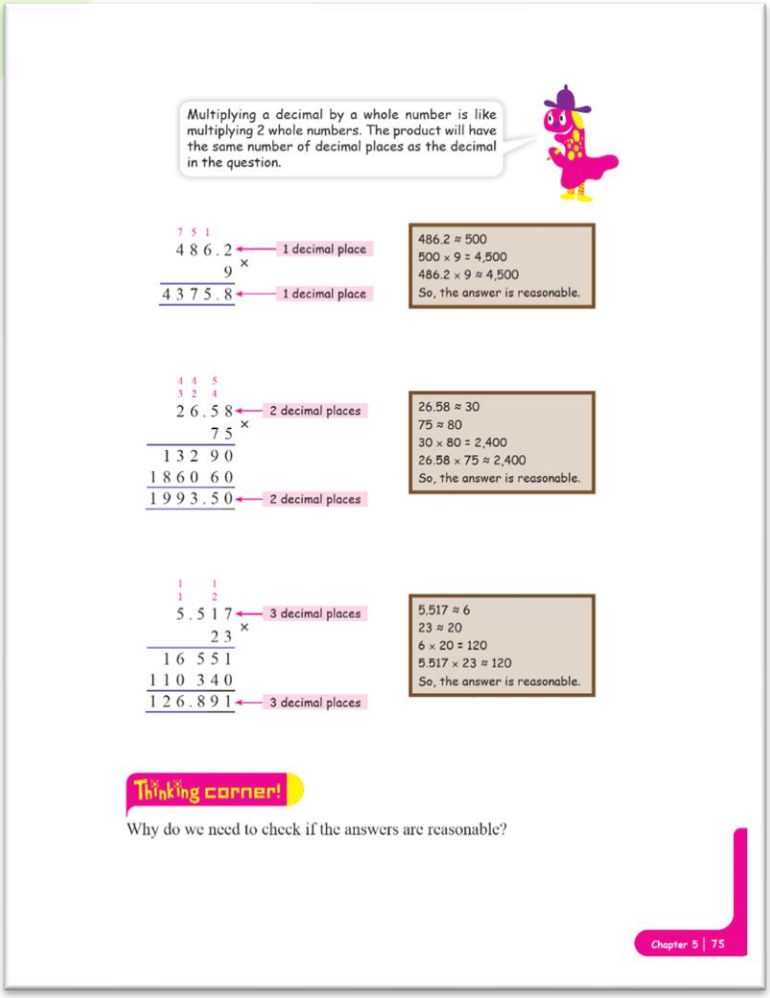


Teaching ideas

5. Then, ask them to add up the 0.01 discs. Are they more than 10 discs? Should they regroup them?
6. Then, ask them to add up the 0.1 discs. Are they more than 10 discs? Should they regroup them? What do they get at the end?
7. Guide them to relate this method with the vertical multiplication. Tell them that they should start to multiply the thousandths first, then the hundredths, the tenths and lastly the whole numbers, if any. Always regroup when necessary.
8. Ask them to take note of the number of decimal places of the decimal and the product. They are the same.

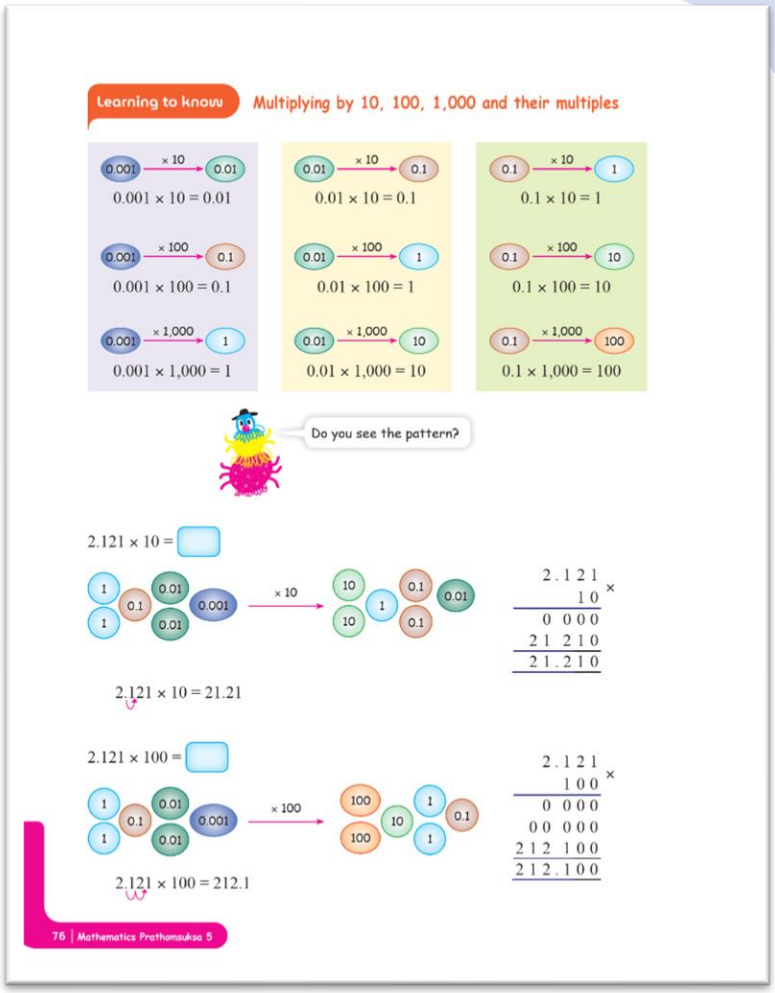
Teaching ideas

9. Guide them to multiply 486.2 by 9. Ask them to take note of the number of decimal places of the decimal and the product. They are the same. Ask them to use estimation to check if their answer is reasonable.
10. Help them to recall how to multiply a number by a 2-digit number. Get a volunteer to multiply 512 by 34 vertically on the board. Reiterate that when multiplying a number by a 2-digit number, they are actually finding the sum of the product of the number by the ones of the 2-digit, and the product of the number by the tens of the 2-digit number.
11. Guide them to multiply 26.58 by 75. Ask them to take note of the number of decimal places of the decimal and the product. They are the same. Ask them to use estimation to check if their answer is reasonable.
12. Repeat with the next example.



Thinking Corner!

Tell the students that checking for reasonableness is a process by which we evaluate estimations to see if they are reasonable guesses for a problem. It helps check our answers for accuracy.



Teaching ideas

1. Using the decimal discs, guide them to multiply 0.001 by 10, by 100 and by 1,000. Help them to realize the pattern in the answers.

   0.001 x 10 = 0.010

   0.001 x 100 = 0.100

   0.001 x 1,000 = 1.000

2. Repeat with other decimals by 10, 100 and 1,000. When we multiple a decimal by 10, 100 or 1,000, we move the decimal point as many steps as there are zeros in the number 10, 100 or 1,000.

3. This applies to any decimals. Use the examples to explain further. Encourage them to multiply vertically to verify the answers.

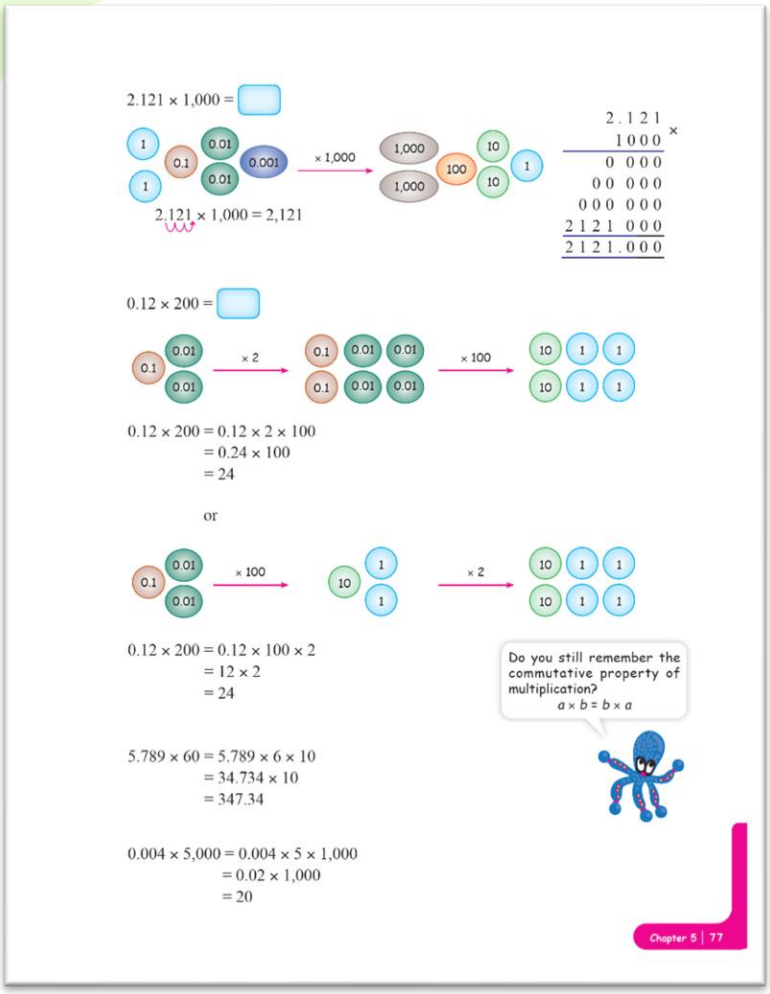
Teaching ideas

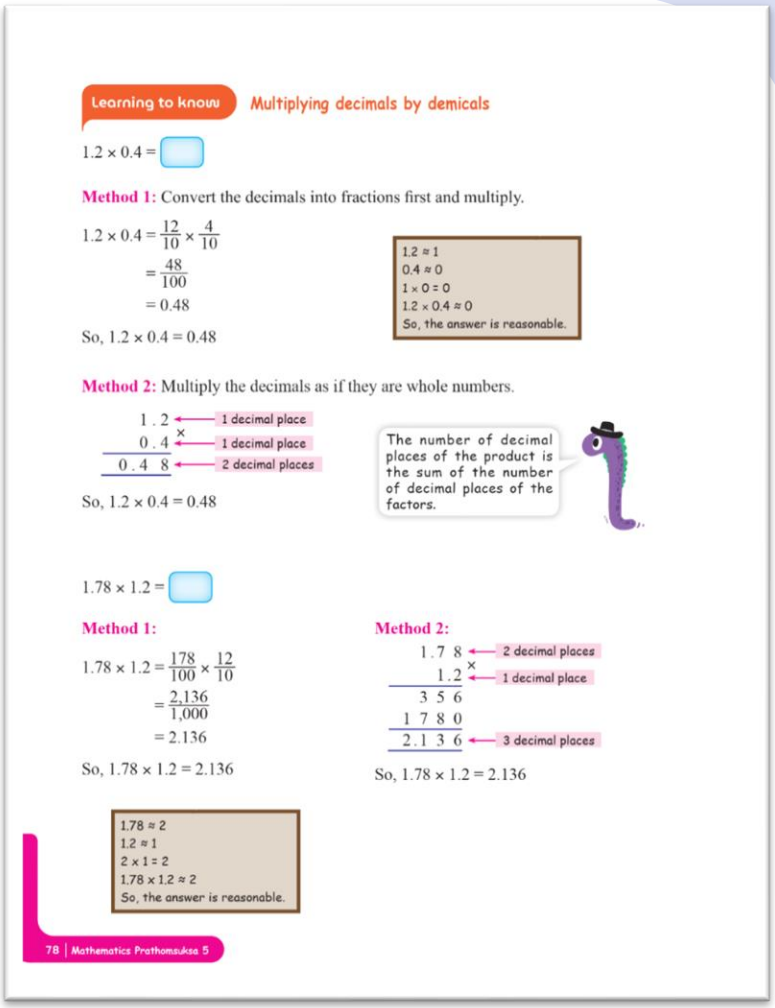
4. Repeat with the example.

5. Repeat with multiplication of 0.12 x 200, 5.789 x 60 and 0.004 x 5,000. Help them to realize the pattern in the answers.

0.12 x 200 = 24.00 5.789 x 60 = 347.340 0.004 x 5,000 = 20.000

6. Tell the students that to multiply a decimal by a multiple of 10, 100 or 1,000, we need to:
   - Multiply the non-zero part of the numbers.
   - Count the zeros in the multiple of 10.
   - Add the same number of zeros to the product.
   - Make sure the products have the same number of decimal places as that of the decimal.





Learning to know Multiplying decimals by demicals

$1.2 \times 0.4 =$ ☐

Method 1: Convert the decimals into fractions first and multiply.

$1.2 \times 0.4 = \frac{12}{10} \times \frac{4}{10}$

$= \frac{48}{100}$

$= 0.48$

So, $1.2 \times 0.4 = 0.48$

$1.2 \approx 1$
$0.4 \approx 0$
$1 \times 0 = 0$
$1.2 \times 0.4 \approx 0$
So, the answer is reasonable.

Method 2: Multiply the decimals as if they are whole numbers.

1 . 2 ← 1 decimal place
× 0 . 4 ← 1 decimal place
0 . 4 8 ← 2 decimal places

So, $1.2 \times 0.4 = 0.48$

The number of decimal places of the product is the sum of the number of decimal places of the factors.

$1.78 \times 1.2 =$ ☐

Method 1:

$1.78 \times 1.2 = \frac{178}{100} \times \frac{12}{10}$

$= \frac{2,136}{1,000}$

$= 2.136$

So, $1.78 \times 1.2 = 2.136$

Method 2:

1 . 7 8 ← 2 decimal places
× 1 . 2 ← 1 decimal place
3 5 6
1 7 8 0
2 . 1 3 6 ← 3 decimal places

So, $1.78 \times 1.2 = 2.136$

$1.78 \approx 2$
$1.2 \approx 1$
$2 \times 1 = 2$
$1.78 \times 1.2 \approx 2$
So, the answer is reasonable.

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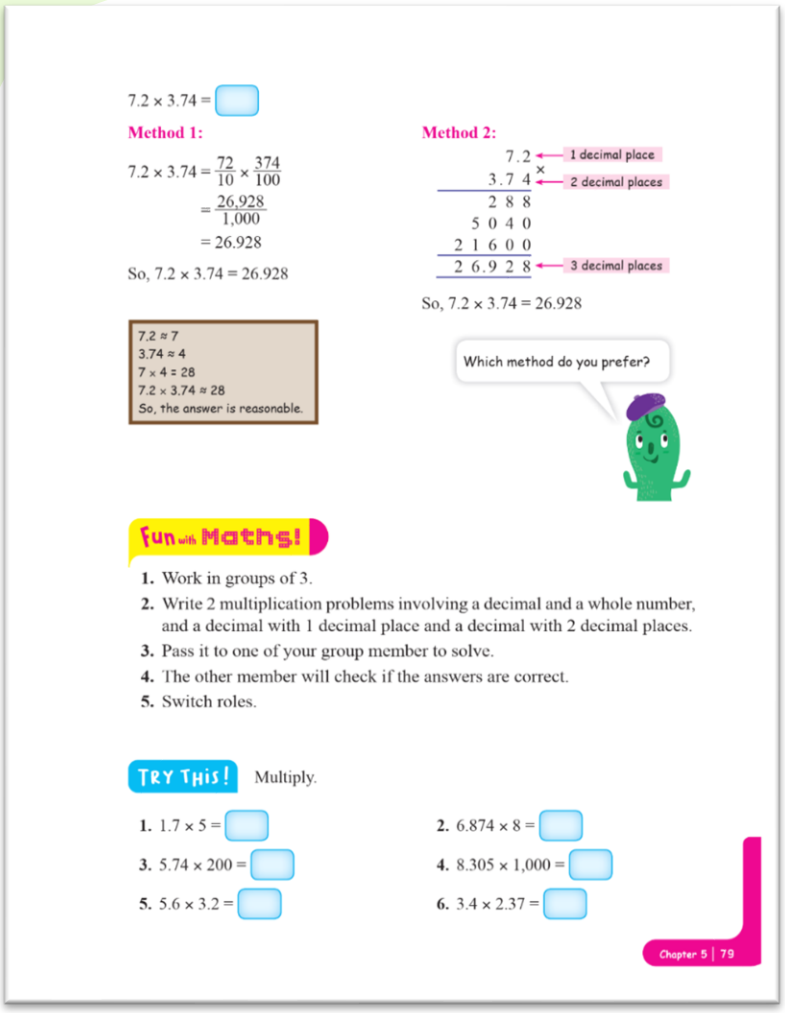
Teaching ideas

1. Tell the students that we can multiply a decimal by a decimal using 2 methods.
2. We can convert the decimals into fractions first before multiplying. Use the example to explain.
3. We can also multiply them as if they are whole numbers. We put in the decimal point in the product where the number of decimal places of the product is the sum of the number of decimal places of the factors. Use the example to explain.
4. Repeat with multiplying 1.78 x 1.2 using both methods. Guide the students to put the decimal point in the product.
5. Ask them to use estimation to check if the answers are reasonable.

Teaching ideas

6. Repeat with multiplying 7.2 x 3.74 using both methods. Guide the students to put the decimal point in the product.
7. Ask them to use estimation to check if the answers are reasonable.
8. Guide the students to refer to **Starting Point** on page 73. Ask them to answer the questions. Have a discussion to conclude the lesson.



$7.2 \times 3.74 =$ ☐

Method 1:

$7.2 \times 3.74 = \frac{72}{10} \times \frac{374}{100}$

$= \frac{26,928}{1,000}$

$= 26.928$

So, $7.2 \times 3.74 = 26.928$

$7.2 \approx 7$
$3.74 \approx 4$
$7 \times 4 = 28$
$7.2 \times 3.74 \approx 28$
So, the answer is reasonable.

Method 2:

7.2 ← 1 decimal place
× 3.74 ← 2 decimal places
288
5040
21600
26.928 ← 3 decimal places

So, $7.2 \times 3.74 = 26.928$

Which method do you prefer?

Fun with Maths!

1. Work in groups of 3.
2. Write 2 multiplication problems involving a decimal and a whole number, and a decimal with 1 decimal place and a decimal with 2 decimal places.
3. Pass it to one of your group member to solve.
4. The other member will check if the answers are correct.
5. Switch roles.

TRY THIS! Multiply.

1. $1.7 \times 5 =$ ☐
2. $6.874 \times 8 =$ ☐
3. $5.74 \times 200 =$ ☐
4. $8.305 \times 1,000 =$ ☐
5. $5.6 \times 3.2 =$ ☐
6. $3.4 \times 2.37 =$ ☐

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Fun with Maths!

Materials required: Paper

Objective of the activity: Multiplying a decimal by a whole number, and decimals

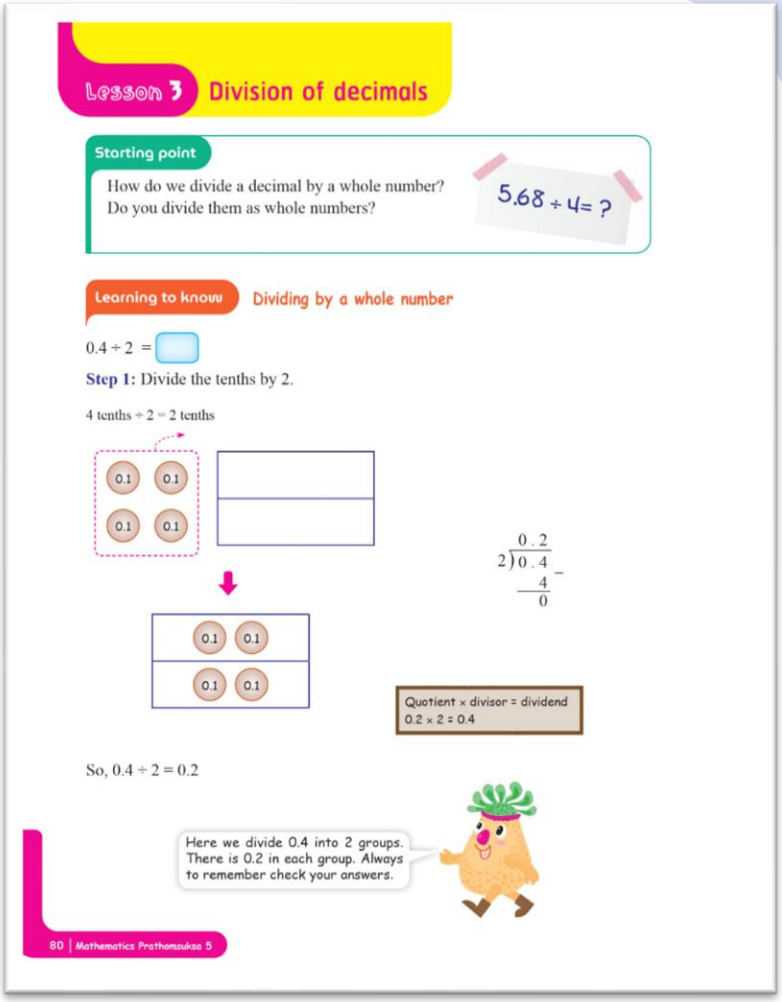
If the answers are not correct, point out where the mistakes are. The students should learn and avoid similar mistakes.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 65 to 68 in Go Get Maths Workbook P5.


Lesson 3 Division of decimals

Starting point

How do we divide a decimal by a whole number?
Do you divide them as whole numbers?

5.68 ÷ 4 = ?

Learning to know Dividing by a whole number

0.4 ÷ 2 = ☐

Step 1: Divide the tenths by 2.

4 tenths ÷ 2 = 2 tenths

0.1 0.1 0.1 0.1

0.1 0.1 0.1 0.1

$$2\overline{)0.4} = 0.2, \quad -\frac{4}{0}$$

Quotient × divisor = dividend
0.2 × 2 = 0.4

So, 0.4 ÷ 2 = 0.2

Here we divide 0.4 into 2 groups. There is 0.2 in each group. Always to remember check your answers.

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Lesson 3
Division of decimals

Lesson objectives

By the end of the lesson, the students should be able to:

1. Divide a decimal by a whole number.
2. Divide a decimal by 10, 100 and 1,000, and their multiples.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

Division, decimal

Materials needed

Number discs, decimal discs

Starting point

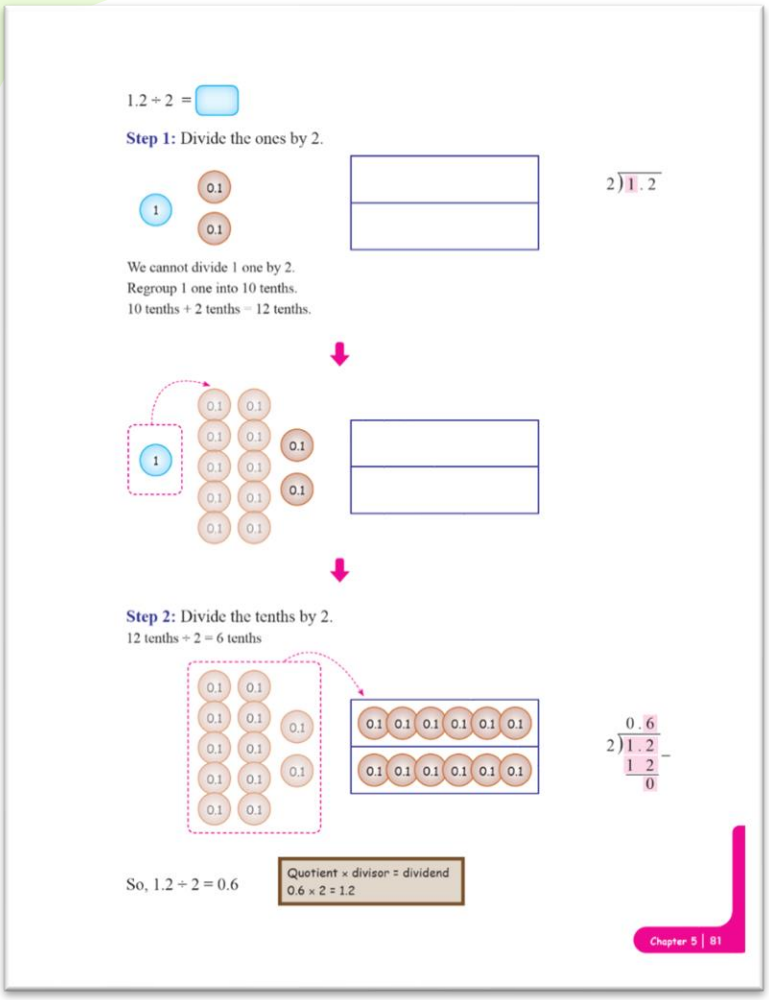
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

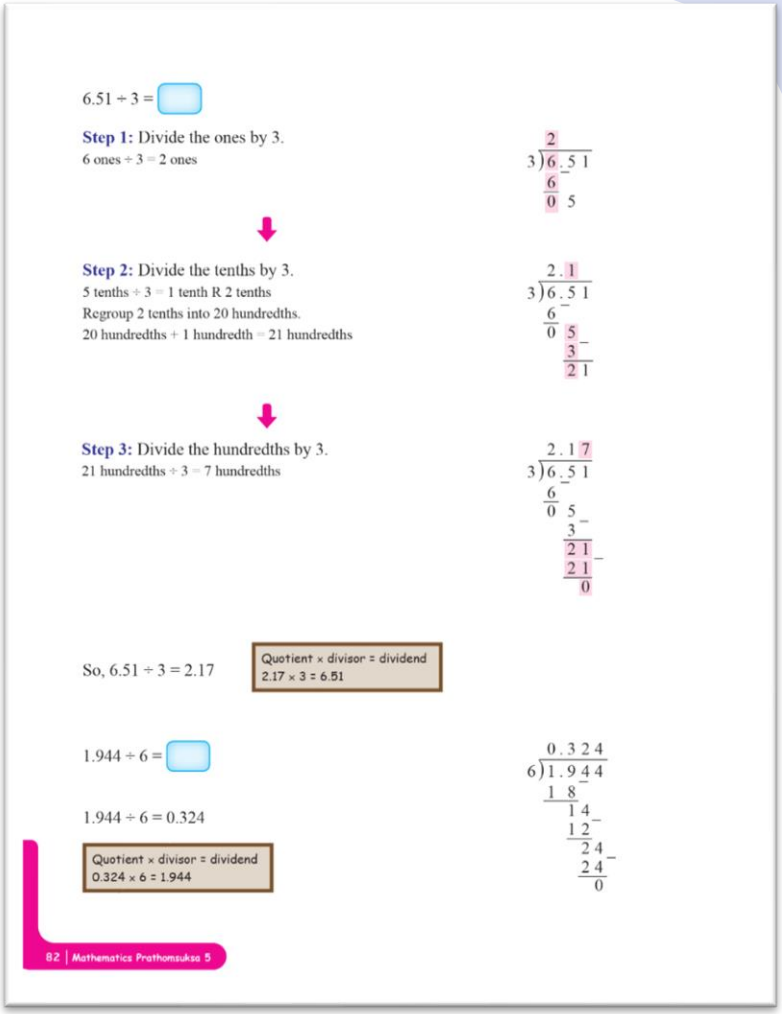
Teaching ideas

1. Give some decimal discs to a group of students. Ask them to use the number discs to represent 0.4.
2. Ask them how to divide the number discs into 2 equal groups. Ask them these questions to start the discussion:
   - How many tenths are there in each group?
   - Are there any tenths left?
   - What is 0.4 divided by 2?
3. Guide them to divide using the long division method step by step. Ask them to align the decimal points.
4. Guide them to check their answer.

Teaching ideas

5. Give some number and decimal discs to a group of students. Ask them to use the discs to represent 1.2.
6. Ask them how to divide the discs into 2 equal groups. Ask them these questions to start the discussion:
   a) Should you divide the ones or the tens first?
   b) Divide the tens first. Can you divide 1 whole into 2 groups? What should you do?
   c) How many 0.1 discs are there now?
   d) Then, divide the tenths. How many tenths are there in each group?
   e) What is 1.2 divided by 2?
7. Guide them to divide using the long division method step by step. Ask them to put the decimal point in the quotient above the decimal point in the dividend.
8. Ask them to check the answer.





6.51 ÷ 3 = ☐

Step 1: Divide the ones by 3.
6 ones ÷ 3 = 2 ones

$$3\overline{)6.51}\quad 2,\ 6-6=0,\ \text{bring down } 5$$

Step 2: Divide the tenths by 3.
5 tenths ÷ 3 = 1 tenth R 2 tenths
Regroup 2 tenths into 20 hundredths.
20 hundredths + 1 hundredth = 21 hundredths

$$3\overline{)6.51}\quad 2.1,\ 5-3=2,\ \text{bring down } 1$$

Step 3: Divide the hundredths by 3.
21 hundredths ÷ 3 = 7 hundredths

$$3\overline{)6.51}\quad 2.17,\ 21-21=0$$

So, 6.51 ÷ 3 = 2.17

Quotient × divisor = dividend
2.17 × 3 = 6.51

1.944 ÷ 6 = ☐

$$6\overline{)1.944}\quad 0.324,\ 18-18=0,\ 14-12=2,\ 24-24=0$$

1.944 ÷ 6 = 0.324

Quotient × divisor = dividend
0.324 × 6 = 1.944

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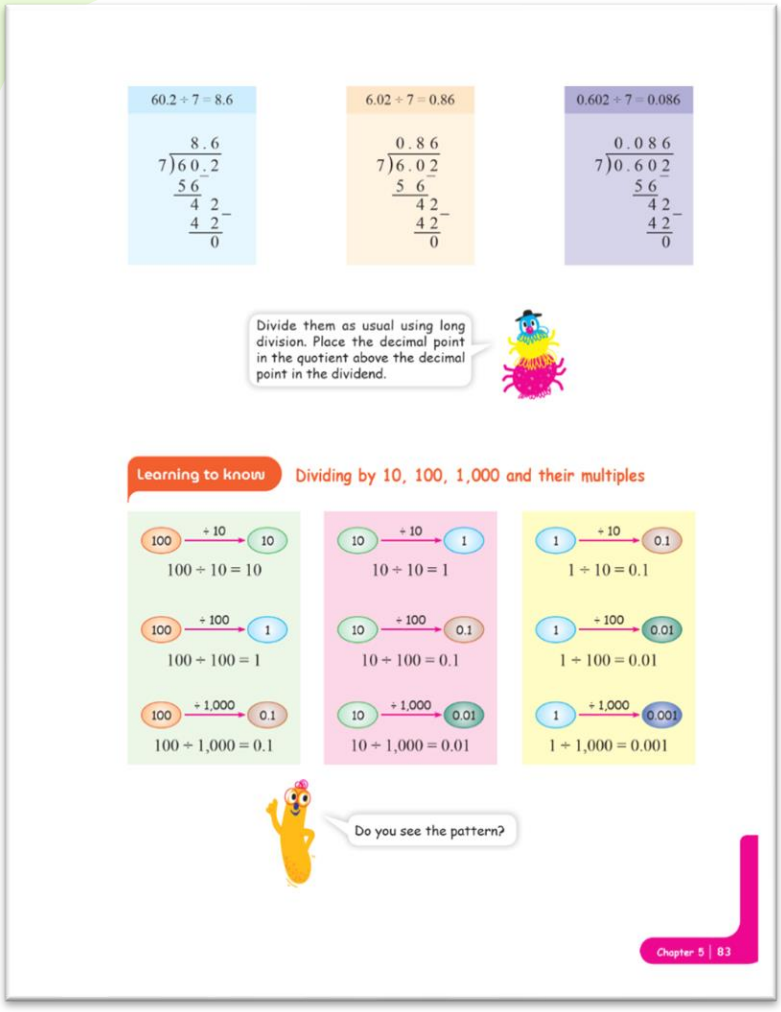
or visit
https://wordwall.net/play/33561/382/574

Teaching ideas

9. Guide them step by step to divide 6.51 by 3 without using the discs.
10. Always ask them to regroup when needed. Ask them to put the decimal point in the quotient above the decimal point in the dividend.
11. Ask them to check the answer.
12. Repeat with the next example.

Teaching ideas

13. Repeat with the examples. Ask the students to take note of the position of the decimal points in the quotients and the decimals points in the dividends. They must be aligned.



Teaching ideas

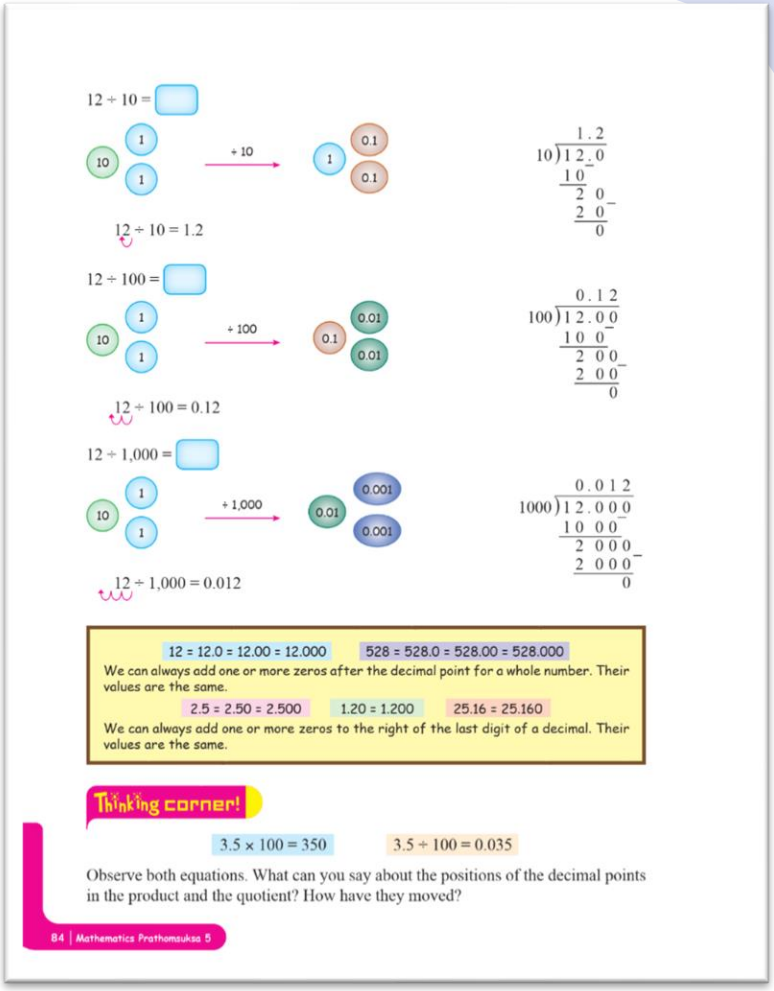
1. Using the number discs, guide the students to divide 100 by 10, 100 by 100 and 100 by 1,000.
2. Ask them if they notice the pattern.

$100 \div 10 = 10$

$100 \div 100 = 1$

$100 \div 1{,}000 = 0.1$

3. Here, the decimal point of the dividend is moved to the left depending of the number of zeroes in the divisor.
4. Repeat with 10 and 1 instead of 100.



$12 \div 10 =$ ☐

÷ 10

$12 \div 10 = 1.2$

$12 \div 100 =$ ☐

÷ 100

$12 \div 100 = 0.12$

$12 \div 1{,}000 =$ ☐

÷ 1,000

$12 \div 1{,}000 = 0.012$

$12 = 12.0 = 12.00 = 12.000$ $528 = 528.0 = 528.00 = 528.000$

We can always add one or more zeros after the decimal point for a whole number. Their values are the same.

$2.5 = 2.50 = 2.500$ $1.20 = 1.200$ $25.16 = 25.160$

We can always add one or more zeros to the right of the last digit of a decimal. Their values are the same.

Thinking corner!

$3.5 \times 100 = 350$ $3.5 \div 100 = 0.035$

Observe both equations. What can you say about the positions of the decimal points in the product and the quotient? How have they moved?

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More Info

or visit
http://tiny.cc/g3osuz

Teaching ideas

5. Using the number discs, guide the students to divide 12 by 10, 12 by 100 and 12 by 1,000.
6. Ask them if they notice the pattern.

$12 \div 10 = 1.2$

$12 \div 100 = 0.12$

$12 \div 1{,}000 = 0.012$

7. Here, the decimal point of the dividend is moved to the left depending of the number of zeroes in the divisor.
8. Ask them to divide using the long method. Are the answers the same?
9. Help them to recall that by adding zeros after a decimal point of a whole number will not change its value. For decimals, their values are the same if zeros are added to the right of the last digit.

$45 = 45.0 = 45.00 = 45.000$
$12.3 = 12.30 = 12.300$
Their values are the same.

Thinking Corner!

Ask the students to analyze $3.5 \times 100 = 350$. Ask them these questions to start a discussion:

a) When a decimal is multiplied by 100, will the product be greater than the decimal? Why?
b) What can you say about the position of the decimal point in the product compared to that of the decimal?

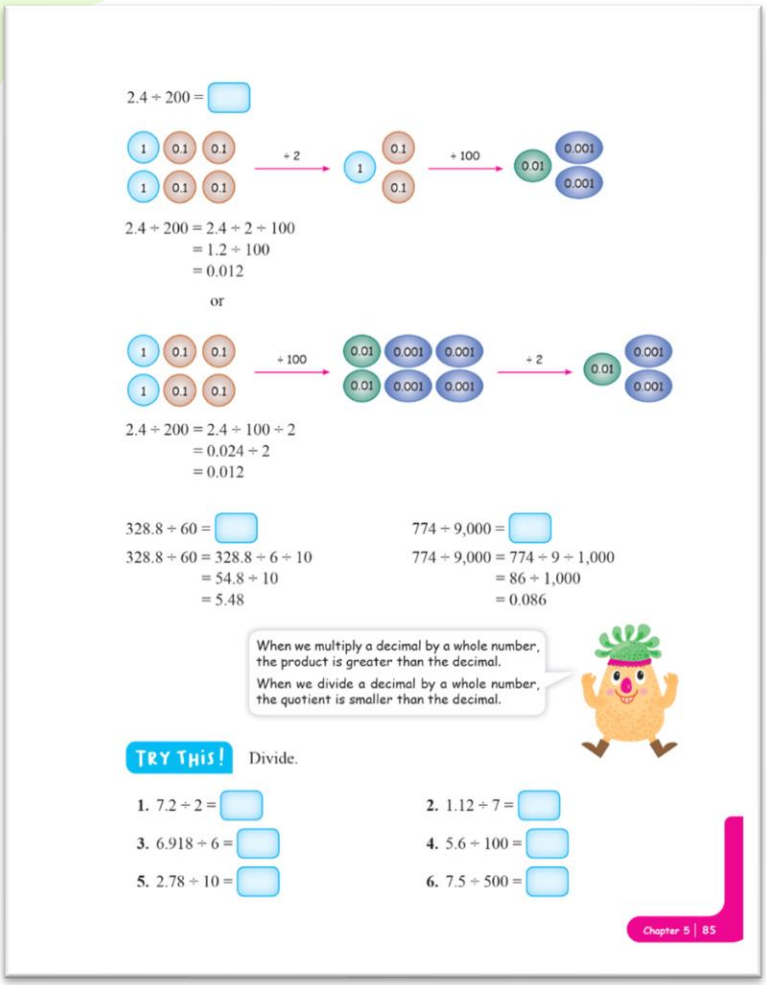
Repeat with $3.5 \div 100 = 0.035$.

Teaching ideas

10. Using the number and decimal discs, guide the students to divide 2.4 by 200. Tell them that they can divide 2.4 by 2 and then by 100 or divide 2.4 by 100 and then by 2, as 200 is the product of 2 and 100.
11. Repeat with 3.28 ÷60 and 774 ÷ 9,000 without using the discs.
12. Remind the students that when we multiply a decimal by a whole number, its product is greater than the decimal. However, when we divide a decimal by a whole number, its quotient is smaller than the decimal.

    2.4 x 2 = 4.8 (greater than 2.4)
    2.4 ÷ 2 = 1.2 (smaller than 2.4)

13. Guide the students to refer to **Starting Point** on page 80. Ask them to answer the questions. Have a discussion to conclude the lesson.



Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

HOTS Qs

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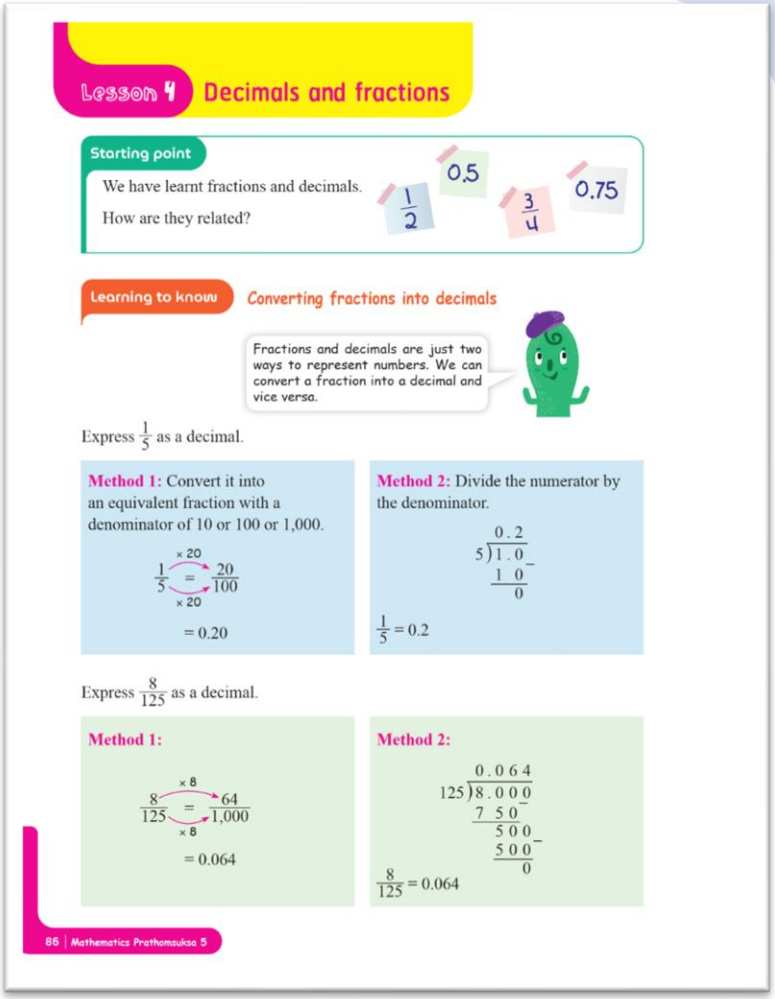
Further practices

Get the students to complete the practices on pages 69 to 71 in Go Get Maths Workbook P5.



Lesson 4 Decimals and fractions

Starting point

We have learnt fractions and decimals.

How are they related?

$\frac{1}{2}$ 0.5 $\frac{3}{4}$ 0.75

Learning to know Converting fractions into decimals

Fractions and decimals are just two ways to represent numbers. We can convert a fraction into a decimal and vice versa.

Express $\frac{1}{5}$ as a decimal.

Method 1: Convert it into an equivalent fraction with a denominator of 10 or 100 or 1,000.

$\frac{1}{5} \overset{\times 20}{=} \frac{20}{100}$

$= 0.20$

Method 2: Divide the numerator by the denominator.

$5\overline{)1.0}$ → 0.2, $\frac{10}{0}$

$\frac{1}{5} = 0.2$

Express $\frac{8}{125}$ as a decimal.

Method 1:

$\frac{8}{125} \overset{\times 8}{=} \frac{64}{1{,}000}$

$= 0.064$

Method 2:

$125\overline{)8.000}$ → 0.064, $\frac{750}{500}$, $\frac{500}{0}$

$\frac{8}{125} = 0.064$

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More Info

or visit
http://tiny.cc/s3osuz

Lesson 4
Decimals and fractions

Lesson objectives

By the end of the lesson, the students should be able to:

1. Convert fractions into decimals.
2. Convert decimals into fractions.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Decimal, fraction

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Help the students to recall that decimals are fractions with denominators of 10, 100 or 1,000.

$0.3 = \frac{3}{10}$ $0.03 = \frac{3}{100}$ $0.003 = \frac{3}{1{,}000}$

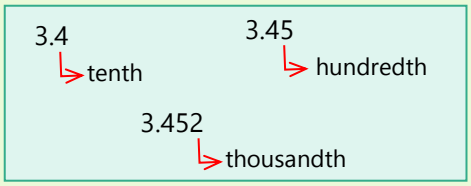
2. Guide the students to understand that to convert a fraction with a denominator that is not 10, 100 or 1,000, we can convert it into its equivalent fraction with a denominator of 10, 100 or 1,000 first.
3. We can also divide the numerator by its denominator.
4. Use the examples to explain further.

Teaching ideas

5. For a mixed number, we should convert it into an improper fraction first, then into its equivalent fraction with a denominator of 10, 100 or 1,000. After converting it into an improper fraction, we can also divide the numerator by its denominator.
6. Use the example to explain further.

Teaching ideas

1. To convert a decimal into a fraction, ask the student to take note of the place value of the rightmost digit in the decimal. It gives the denominator.



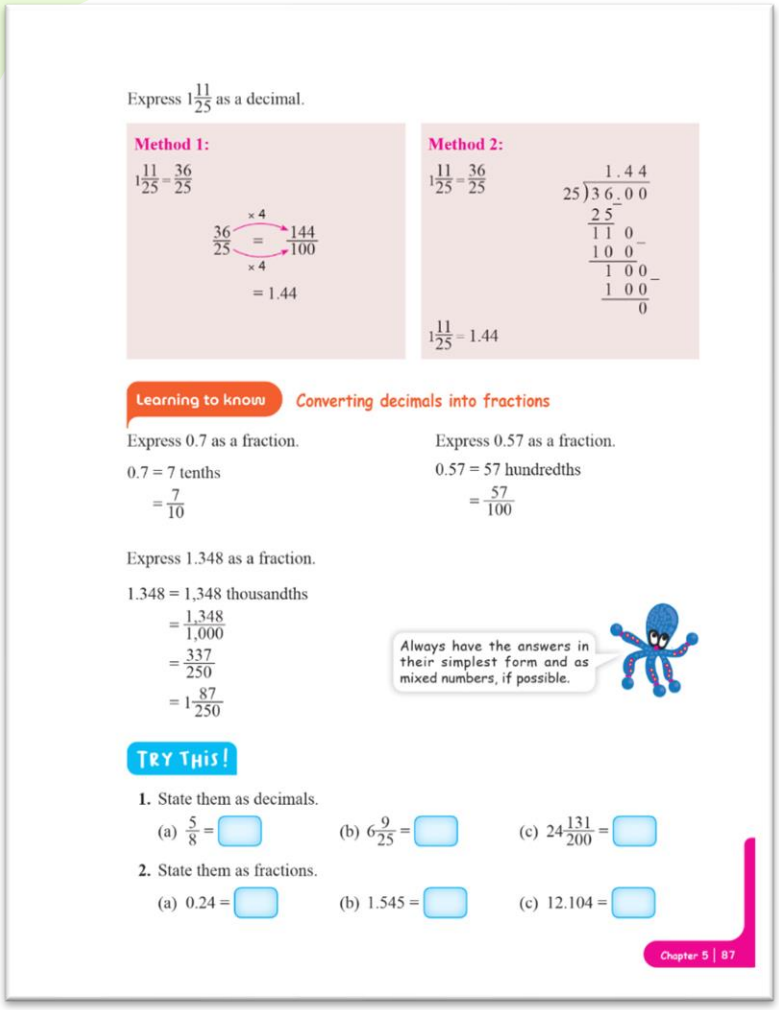
2. Then, ask them to take the digits starting from the first non-zero digit in the decimal as the numerator.
3. Use the examples to explain more. Remind them to always simplify the fractions.
4. Guide the students to refer to **Starting Point** on page 86. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 72 to 74 in Go Get Maths Workbook P5.



Express $1\frac{11}{25}$ as a decimal.

Method 1:

$1\frac{11}{25} = \frac{36}{25}$

$\frac{36}{25} \overset{\times 4}{=} \frac{144}{100}$

$= 1.44$

Method 2:

$1\frac{11}{25} = \frac{36}{25}$

$25\overline{)36.00}$ → 1.44

25

110

100

100

100

0

$1\frac{11}{25} = 1.44$

Learning to know Converting decimals into fractions

Express 0.7 as a fraction.

$0.7 = 7$ tenths

$= \frac{7}{10}$

Express 0.57 as a fraction.

$0.57 = 57$ hundredths

$= \frac{57}{100}$

Express 1.348 as a fraction.

$1.348 = 1{,}348$ thousandths

$= \frac{1{,}348}{1{,}000}$

$= \frac{337}{250}$

$= 1\frac{87}{250}$

Always have the answers in their simplest form and as mixed numbers, if possible.

TRY THIS!

1. State them as decimals.
   (a) $\frac{5}{8} =$ ☐ (b) $6\frac{9}{25} =$ ☐ (c) $24\frac{131}{200} =$ ☐
2. State them as fractions.
   (a) $0.24 =$ ☐ (b) $1.545 =$ ☐ (c) $12.104 =$ ☐

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More Info

or visit
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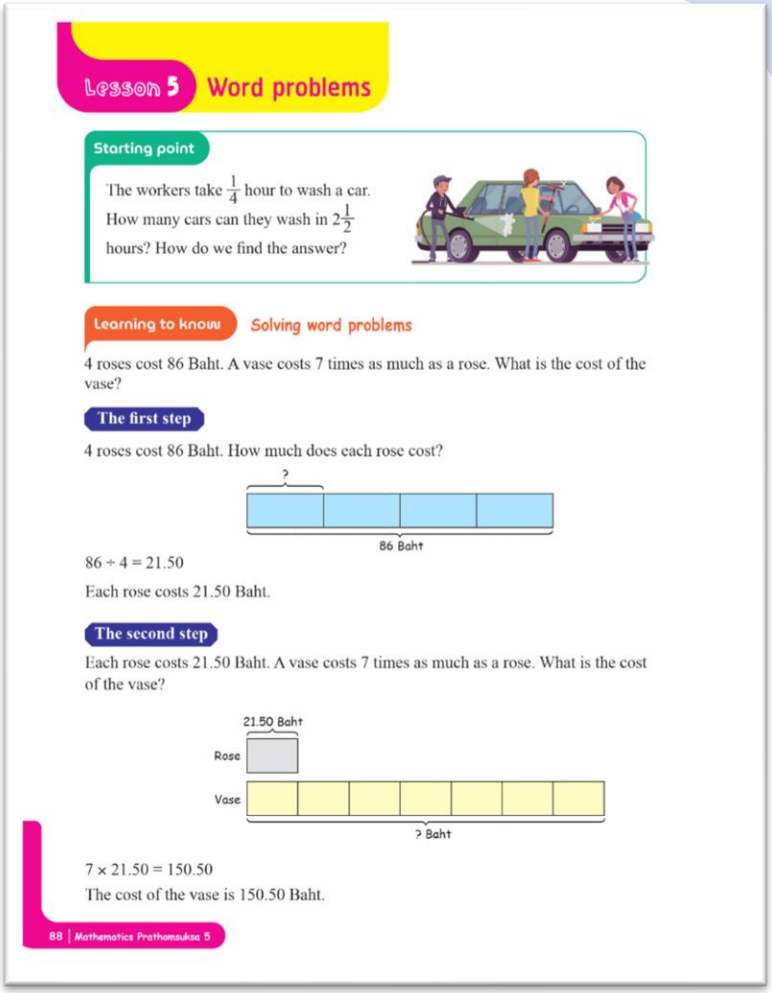

Lesson 5 Word problems

Starting point

The workers take $\frac{1}{4}$ hour to wash a car. How many cars can they wash in $2\frac{1}{2}$ hours? How do we find the answer?

Learning to know Solving word problems

4 roses cost 86 Baht. A vase costs 7 times as much as a rose. What is the cost of the vase?

The first step

4 roses cost 86 Baht. How much does each rose cost?

?

86 Baht

$86 \div 4 = 21.50$

Each rose costs 21.50 Baht.

The second step

Each rose costs 21.50 Baht. A vase costs 7 times as much as a rose. What is the cost of the vase?

21.50 Baht

Rose

Vase

? Baht

$7 \times 21.50 = 150.50$

The cost of the vase is 150.50 Baht.

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Lesson 5
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving decimals.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Inform the students that these word problems involve 2 steps. They need to understand the number story and the question well.
2. For this example, guide the students to use the 3 steps. Set them thinking about these questions:
   a) What do I know?
      - The cost of 4 roses
      - The cost of the vase compared to the cost of the rose
   b) What do I need to find at the end?
      - The cost of the vase
   c) What do I need to find out first?
      - The cost of a rose

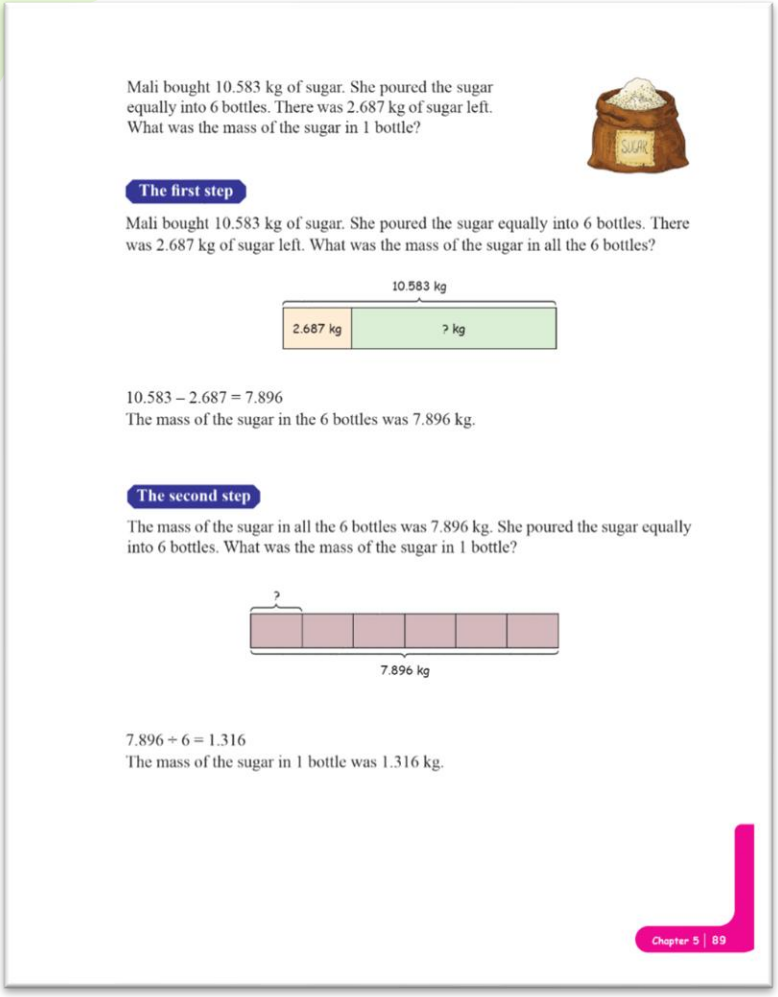
Teaching ideas

3. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The mass of sugar
   - The number of bottles
   - The mass of sugar left

   b) What do I need to find at the end?
   - The mass of sugar in each bottle

   c) What do I need to find out first?
   - The total mass of sugar in the 6 bottles



Mali bought 10.583 kg of sugar. She poured the sugar equally into 6 bottles. There was 2.687 kg of sugar left. What was the mass of the sugar in 1 bottle?

The first step

Mali bought 10.583 kg of sugar. She poured the sugar equally into 6 bottles. There was 2.687 kg of sugar left. What was the mass of the sugar in all the 6 bottles?

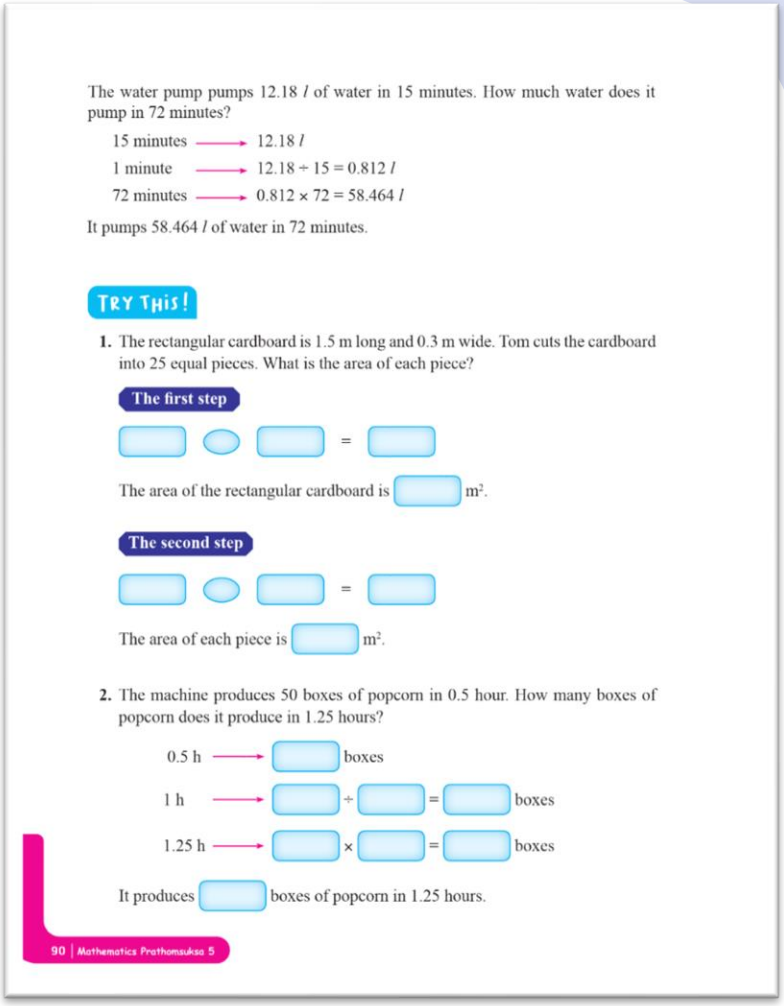
10.583 – 2.687 = 7.896
The mass of the sugar in the 6 bottles was 7.896 kg.

The second step

The mass of the sugar in all the 6 bottles was 7.896 kg. She poured the sugar equally into 6 bottles. What was the mass of the sugar in 1 bottle?

7.896 ÷ 6 = 1.316
The mass of the sugar in 1 bottle was 1.316 kg.

Chapter 5 | 89



The water pump pumps 12.18 *l* of water in 15 minutes. How much water does it pump in 72 minutes?

15 minutes → 12.18 *l*

1 minute → 12.18 ÷ 15 = 0.812 *l*

72 minutes → 0.812 × 72 = 58.464 *l*

It pumps 58.464 *l* of water in 72 minutes.

TRY THIS!

1. The rectangular cardboard is 1.5 m long and 0.3 m wide. Tom cuts the cardboard into 25 equal pieces. What is the area of each piece?

The first step

[ ] [ ] [ ] = [ ]

The area of the rectangular cardboard is [ ] m².

The second step

[ ] [ ] [ ] = [ ]

The area of each piece is [ ] m².

2. The machine produces 50 boxes of popcorn in 0.5 hour. How many boxes of popcorn does it produce in 1.25 hours?

0.5 h → [ ] boxes

1 h → [ ] ÷ [ ] = [ ] boxes

1.25 h → [ ] × [ ] = [ ] boxes

It produces [ ] boxes of popcorn in 1.25 hours.

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Teaching ideas

4. For this example, guide the students to use the 3 steps. Set them thinking about these questions:

   a) What do I know?
   - The volume of water pumped in 15 minutes

   b) What do I need to find at the end?
   - The volume of water pumped in 72 minutes

   c) What do I need to find out first?
   - The volume of water pumped in 1 minute

5. Guide the students to refer to **Starting Point** on page 88. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 2 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 75 to 79 in Go Get Maths Workbook P5.

Chapter 6
Percentages

The big idea

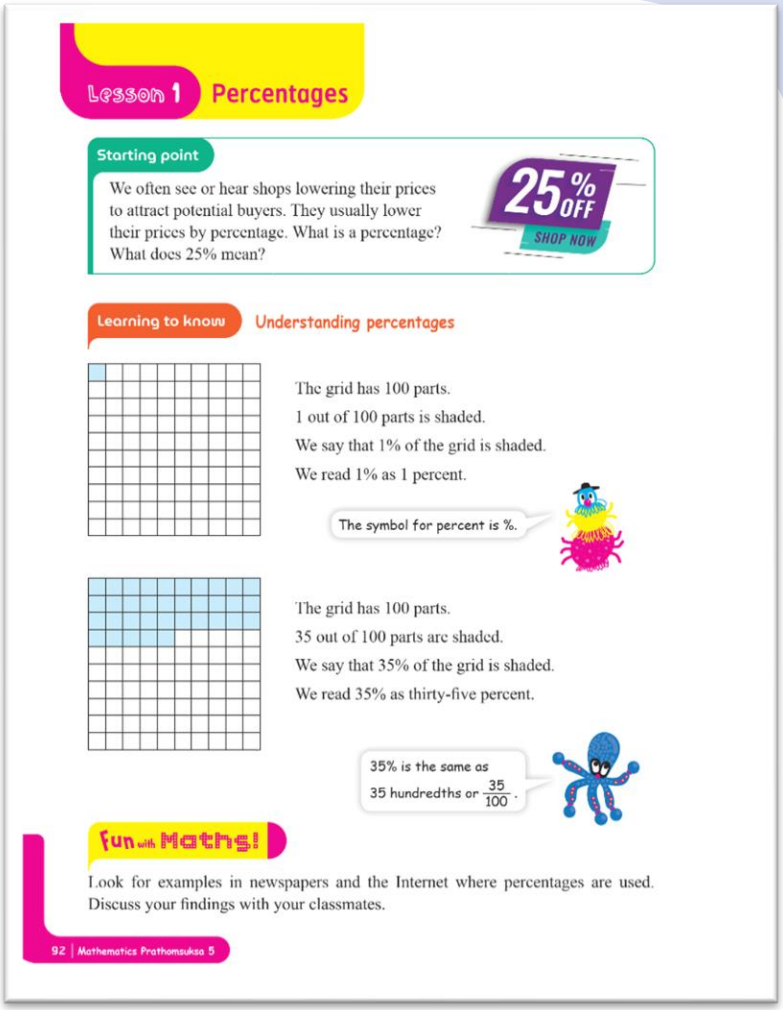
1. Ask the students to look at the picture carefully.
2. Ask them these questions to start a discussion:
   a) Have they seen shops that put up the sign or banner saying SALE?
   b) What does that mean?
   c) Do you usually see the sign or banner saying certain % off?
   d) What does that mean?

Strand 1: Numbers and algebra

Standard M.1.1 Numbers

Indicators:

M 1.1 Gr5/9 Show mathematical methods of finding answers of not more than 2- step percentage word problems.



Lesson 1 Percentages

Starting point

We often see or hear shops lowering their prices to attract potential buyers. They usually lower their prices by percentage. What is a percentage? What does 25% mean?

Learning to know Understanding percentages

The grid has 100 parts.
1 out of 100 parts is shaded.
We say that 1% of the grid is shaded.
We read 1% as 1 percent.

The symbol for percent is %.

The grid has 100 parts.
35 out of 100 parts are shaded.
We say that 35% of the grid is shaded.
We read 35% as thirty-five percent.

35% is the same as 35 hundredths or $\frac{35}{100}$.

Fun with Maths!

Look for examples in newspapers and the Internet where percentages are used. Discuss your findings with your classmates.

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or visit
http://tiny.cc/84osuz

Lesson 1 Percentages

Lesson objectives

By the end of the lesson, the students should be able to:

1. Understand what percentages are.

Suggested teaching time

2 periods (2 x 50 minutes)

Vocabulary

Percentage

Materials needed

Newspaper, magazines

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

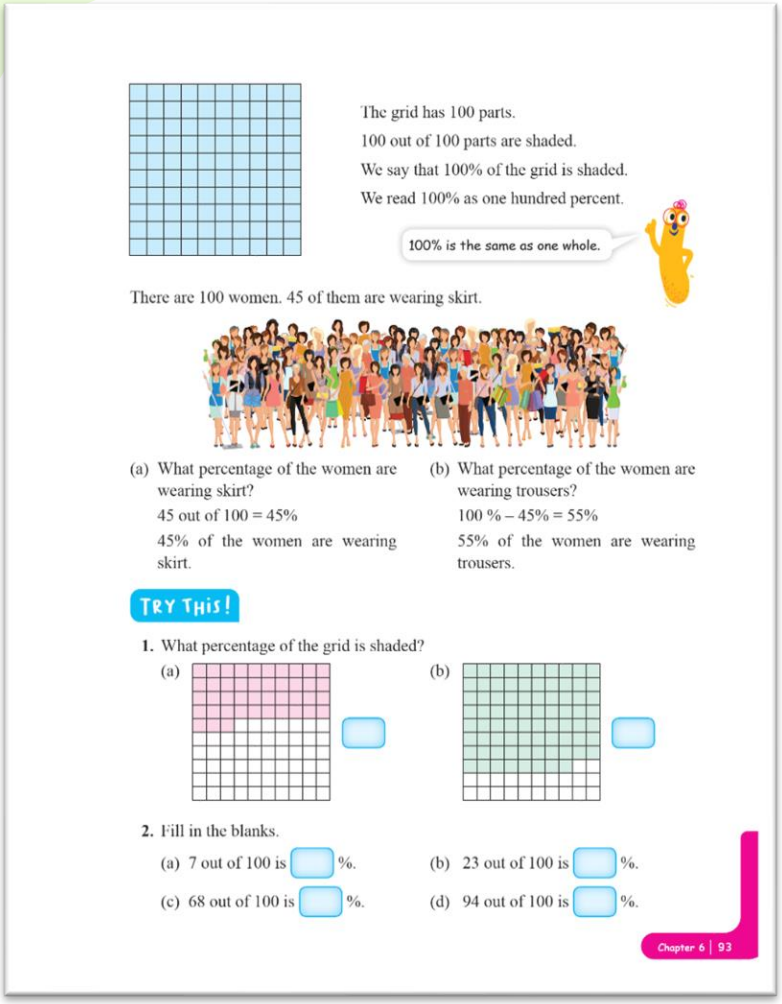
1. Tell the students that a percentage is a number that can be expressed as a fraction of 100. 24% as 24 out of 100 and 50% is 50 out of 100.
2. Introduce % as the symbol of percentage. Guide them how to read the percentage.

Fun with Maths!

Materials required: Newspaper, magazines
Objective of the activity: Examples of percentages used in daily life
Besides it is used in sales, percentages are used in food labels, as an indication of power left in the handphones, and in many statistical reports.

Teaching ideas

3. Ask the students what 100% mean.
4. Guide them to use percentage for a group of 100 items.
5. Tell them to imagine they have 100 balls. Ask them these questions:
   a) If 40 of the 100 balls are red, what percentage of the balls are red?
   b) If 10 of the 100 balls are yellow, what percentage of the balls are yellow?
   c) If 70% of the balls are green, how many balls are green?
   d) If 20% of the balls are purple, how many balls are purple?
6. Guide the students to refer to **Starting Point** on page 92. Ask them to answer the questions. Have a discussion to conclude the lesson.



The grid has 100 parts.
100 out of 100 parts are shaded.
We say that 100% of the grid is shaded.
We read 100% as one hundred percent.

100% is the same as one whole.

There are 100 women. 45 of them are wearing skirt.

(a) What percentage of the women are wearing skirt?
45 out of 100 = 45%
45% of the women are wearing skirt.

(b) What percentage of the women are wearing trousers?
100 % – 45% = 55%
55% of the women are wearing trousers.

TRY THIS!

1. What percentage of the grid is shaded?
(a) (b)

2. Fill in the blanks.
(a) 7 out of 100 is ____ %.
(b) 23 out of 100 is ____ %.
(c) 68 out of 100 is ____ %.
(d) 94 out of 100 is ____ %.

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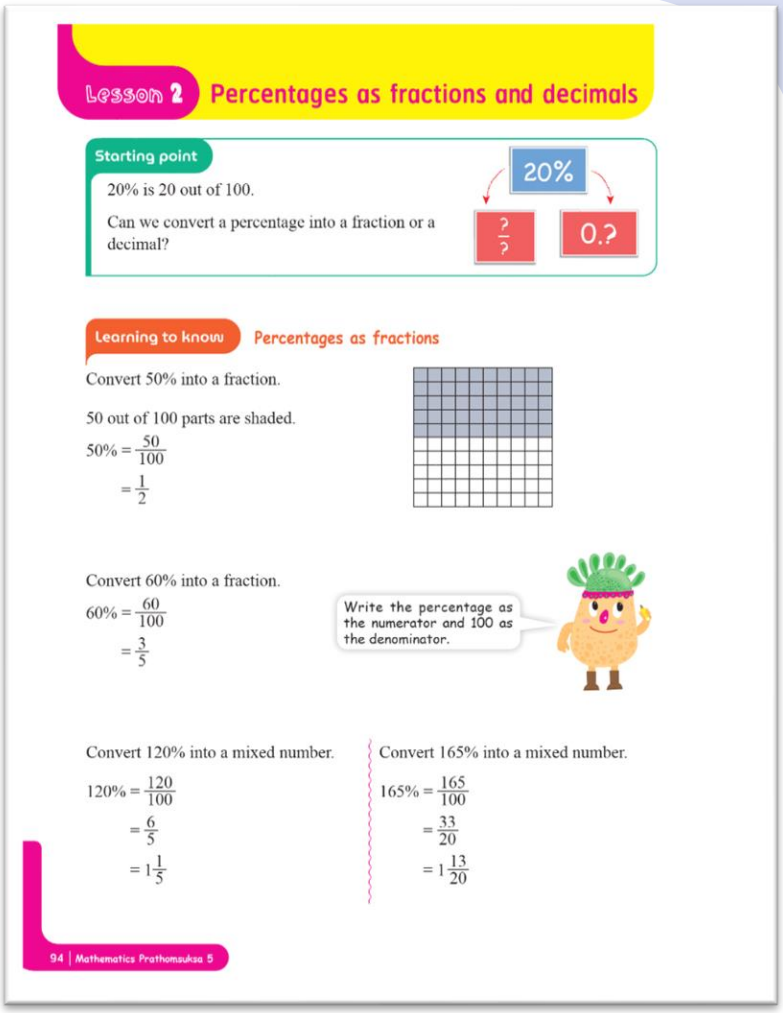
Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 80 and 81 in Go Get Maths Workbook P5.



Lesson 2 Percentages as fractions and decimals

Starting point

20% is 20 out of 100.

Can we convert a percentage into a fraction or a decimal?

20%

? / ?

0.?

Learning to know Percentages as fractions

Convert 50% into a fraction.

50 out of 100 parts are shaded.

$50\% = \frac{50}{100}$

$= \frac{1}{2}$

Convert 60% into a fraction.

$60\% = \frac{60}{100}$

$= \frac{3}{5}$

Write the percentage as the numerator and 100 as the denominator.

Convert 120% into a mixed number.

$120\% = \frac{120}{100}$

$= \frac{6}{5}$

$= 1\frac{1}{5}$

Convert 165% into a mixed number.

$165\% = \frac{165}{100}$

$= \frac{33}{20}$

$= 1\frac{13}{20}$

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Lesson 2 Percentages as fractions and decimals

Lesson objectives

By the end of the lesson, the students should be able to:

1. Convert percentages into fractions.
2. Convert percentages into decimals.

Suggested teaching time

2 periods (2 x 50 minutes)

Vocabulary

Percentage, fraction, decimal

Materials needed

-

Starting point

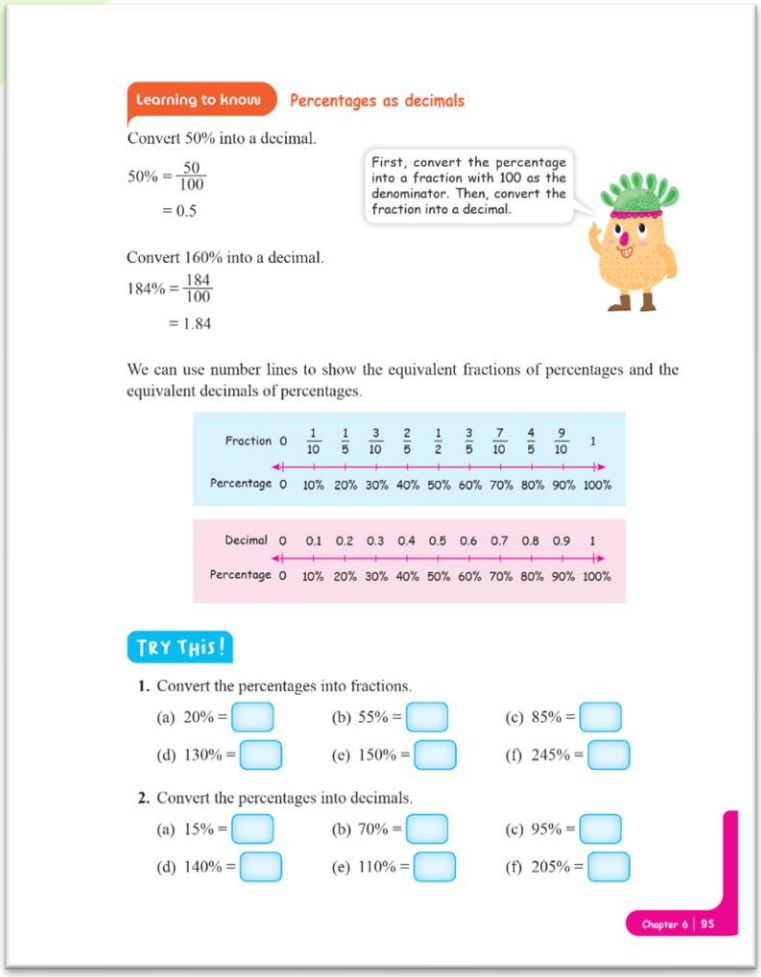
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Reiterate that a percentage is a number that can be expressed as a fraction of 100. Therefore, to convert a percentage into a fraction, we drop the % and divide the number by 100. Remind them to simplify the fraction.
2. Use the examples to explain further.

Teaching ideas

1. To convert a percentage into a decimal, we need to divide the percentage by 100.
2. Use the examples to explain further.
3. Ask 9 students to convert 10%, 20%, 30%... to 90% into fractions.
4. Ask 9 students to convert 10%, 20%, 30%... to 90% into decimals.
5. Draw number lines on the board to show the equivalent fractions of percentages and equivalent decimals of percentages.
6. Guide the students to refer to **Starting Point** on page 94. Ask them to answer the question. Have a discussion to conclude the lesson.



Learning to know Percentages as decimals

Convert 50% into a decimal.

$50\% = \frac{50}{100}$

$= 0.5$

First, convert the percentage into a fraction with 100 as the denominator. Then, convert the fraction into a decimal.

Convert 160% into a decimal.

$184\% = \frac{184}{100}$

$= 1.84$

We can use number lines to show the equivalent fractions of percentages and the equivalent decimals of percentages.

Fraction 0 $\frac{1}{10}$ $\frac{1}{5}$ $\frac{3}{10}$ $\frac{2}{5}$ $\frac{1}{2}$ $\frac{3}{5}$ $\frac{7}{10}$ $\frac{4}{5}$ $\frac{9}{10}$ 1

Percentage 0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Decimal 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

Percentage 0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

TRY THIS!

1. Convert the percentages into fractions.
   (a) 20% = ☐ (b) 55% = ☐ (c) 85% = ☐
   (d) 130% = ☐ (e) 150% = ☐ (f) 245% = ☐
2. Convert the percentages into decimals.
   (a) 15% = ☐ (b) 70% = ☐ (c) 95% = ☐
   (d) 140% = ☐ (e) 110% = ☐ (f) 205% = ☐

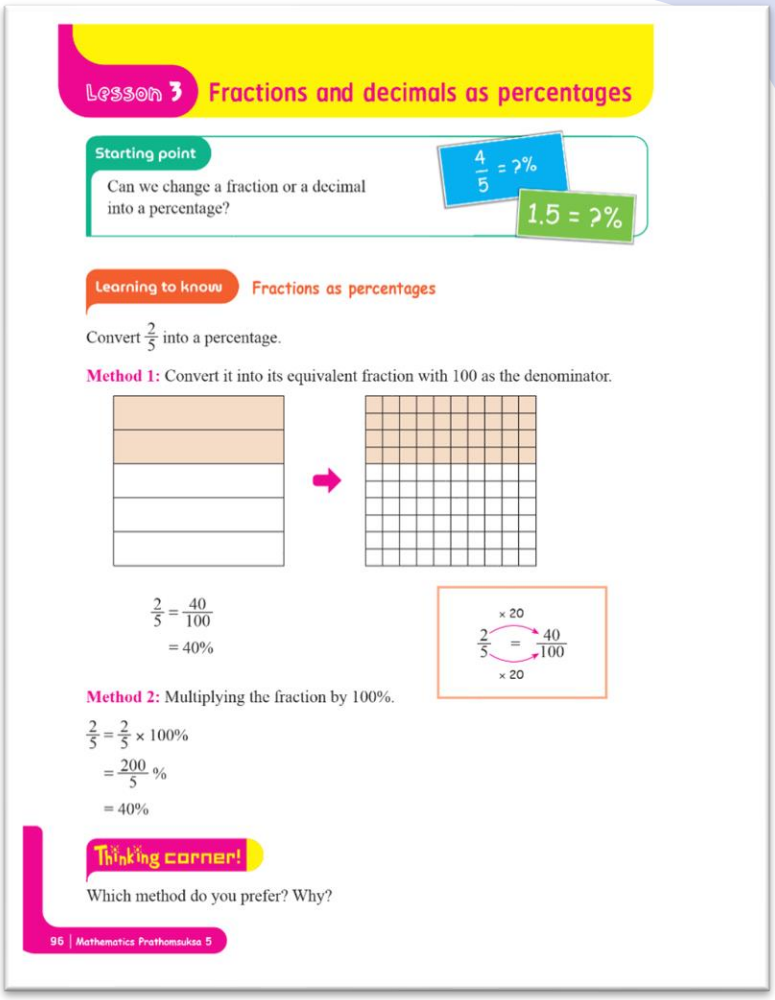
Chapter 6 | 95

Try This!

Get 12 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 82 and 83 in Go Get Maths Workbook P5.



Lesson 3 Fractions and decimals as percentages

Starting point

Can we change a fraction or a decimal into a percentage?

$\frac{4}{5}$ = ?%

1.5 = ?%

Learning to know Fractions as percentages

Convert $\frac{2}{5}$ into a percentage.

Method 1: Convert it into its equivalent fraction with 100 as the denominator.

$\frac{2}{5} = \frac{40}{100}$

$= 40\%$

$\frac{2}{5} \xrightarrow{\times 20} \frac{40}{100}$

Method 2: Multiplying the fraction by 100%.

$\frac{2}{5} = \frac{2}{5} \times 100\%$

$= \frac{200}{5}\%$

$= 40\%$

Thinking corner!

Which method do you prefer? Why?

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More Info

or visit
http://tiny.cc/g4osuz

Lesson 3
Fractions and decimals as percentages

Lesson objectives

By the end of the lesson, the students should be able to:

1. Convert fractions into percentages.
2. Convert decimals into percentages.

Suggested teaching time

2 periods (2 x 50 minutes)

Vocabulary

Percentage, decimal, fraction

Materials needed

Sets of cards of equivalent percentages, fractions and decimals

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Reiterate that a percentage is a number that can be expressed as a fraction of 100. Therefore, to convert a fraction into a percentage, we turn it into its equivalent fraction with 100 as its denominator, before using its numerator as the percentage.
2. Tell the students that we can multiply the fraction with 100% too turn it into a percentage.
3. Use the examples to explain further.

Thinking Corner!

Ask the students which method they prefer. Usually most of them will prefer the multiplication method.

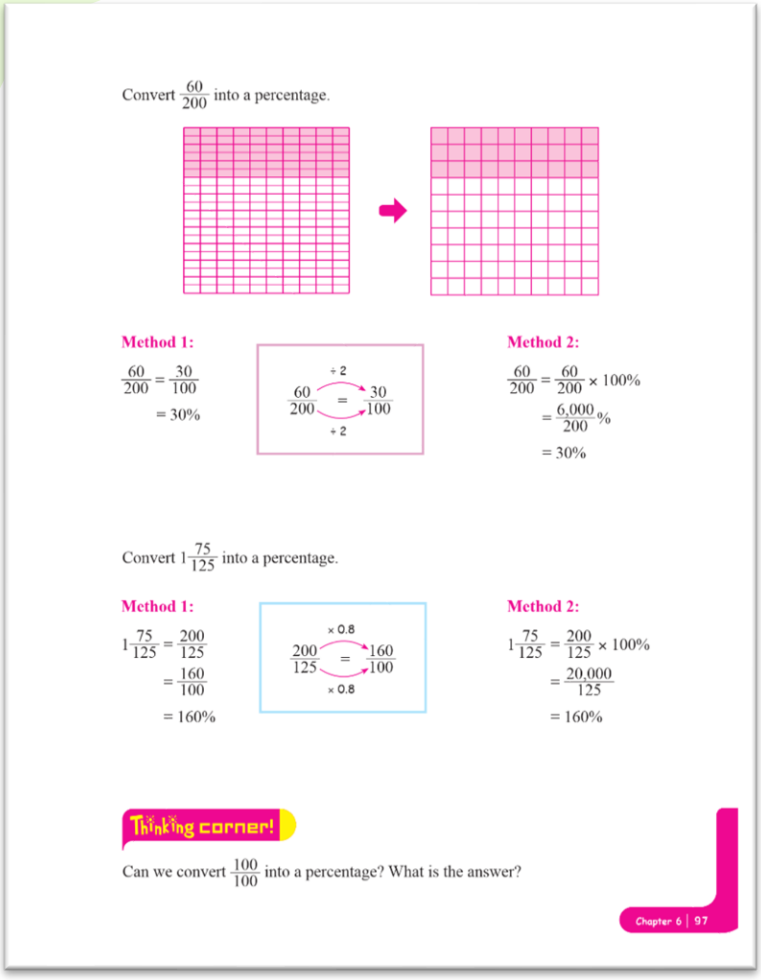
Teaching ideas

4. Use the example to convert $\frac{60}{200}$ into a percentage.
5. Tell the students that for a mixed number, they need to convert it into an improper fraction first before converting it into a percentage.

Thinking Corner!

Help the students to recall that $\frac{100}{100}$ is one whole. Ask them to convert it into a percentage using both methods.

$\frac{100}{100}$ = 100%



Convert $\frac{60}{200}$ into a percentage.

Method 1:

$\frac{60}{200} = \frac{30}{100}$

$= 30\%$

$\frac{60}{200} \overset{\div 2}{=} \frac{30}{100}$

Method 2:

$\frac{60}{200} = \frac{60}{200} \times 100\%$

$= \frac{6,000}{200}\%$

$= 30\%$

Convert $1\frac{75}{125}$ into a percentage.

Method 1:

$1\frac{75}{125} = \frac{200}{125}$

$= \frac{160}{100}$

$= 160\%$

$\frac{200}{125} \overset{\times 0.8}{=} \frac{160}{100}$

Method 2:

$1\frac{75}{125} = \frac{200}{125} \times 100\%$

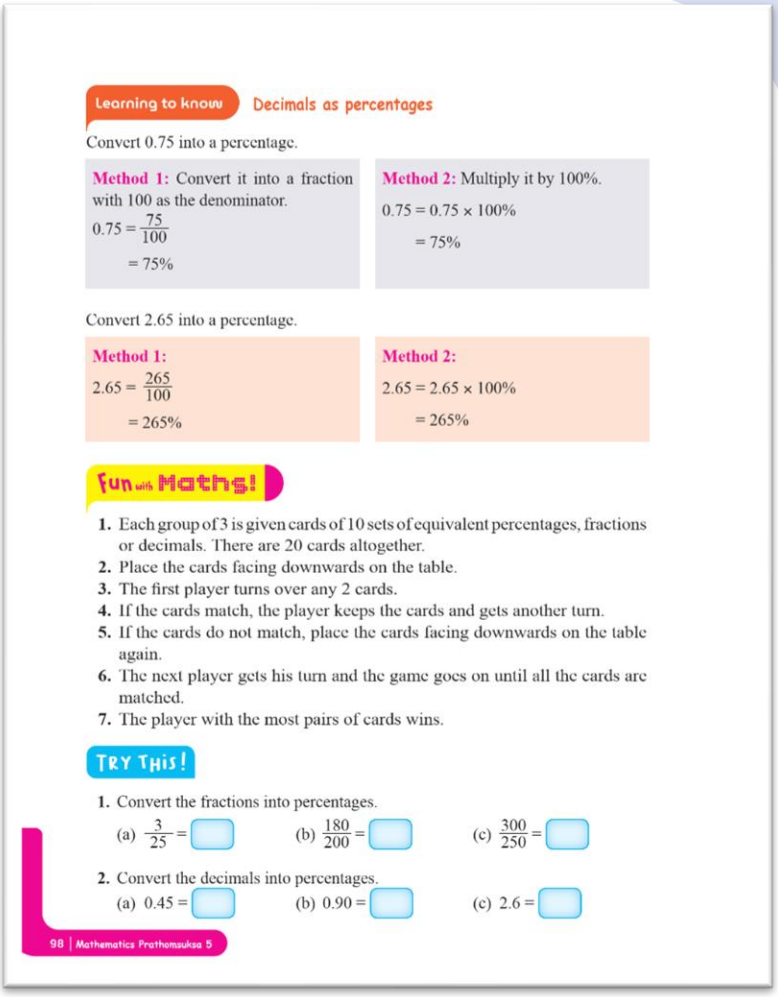
$= \frac{20,000}{125}$

$= 160\%$

Thinking corner!

Can we convert $\frac{100}{100}$ into a percentage? What is the answer?

Chapter 6 | 97



Learning to know Decimals as percentages

Convert 0.75 into a percentage.

Method 1: Convert it into a fraction with 100 as the denominator.

$0.75 = \frac{75}{100}$

$= 75\%$

Method 2: Multiply it by 100%.

$0.75 = 0.75 \times 100\%$

$= 75\%$

Convert 2.65 into a percentage.

Method 1:

$2.65 = \frac{265}{100}$

$= 265\%$

Method 2:

$2.65 = 2.65 \times 100\%$

$= 265\%$

Fun with Maths!

1. Each group of 3 is given cards of 10 sets of equivalent percentages, fractions or decimals. There are 20 cards altogether.
2. Place the cards facing downwards on the table.
3. The first player turns over any 2 cards.
4. If the cards match, the player keeps the cards and gets another turn.
5. If the cards do not match, place the cards facing downwards on the table again.
6. The next player gets his turn and the game goes on until all the cards are matched.
7. The player with the most pairs of cards wins.

TRY THIS!

1. Convert the fractions into percentages.

(a) $\frac{3}{25} =$ ☐ (b) $\frac{180}{200} =$ ☐ (c) $\frac{300}{250} =$ ☐

2. Convert the decimals into percentages.

(a) $0.45 =$ ☐ (b) $0.90 =$ ☐ (c) $2.6 =$ ☐

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More Info

or visit
http://tiny.cc/i4osuz

Teaching ideas

1. Reiterate that a percentage is a number that can be expressed as a fraction of 100. Therefore, to convert a decimal into a percentage, we turn it into its equivalent fraction with 100 before turning it into percentage.
2. Tell the students that we can multiply the decimal with 100% too turn it into a percentage.
3. Use the examples to explain further.
4. Use the example to convert 2.65 into a percentage.
5. Guide the students to refer to **Starting Point** on page 96. Ask them to answer the question. Have a discussion to conclude the lesson.

Fun with Maths!

Materials required: Sets of cards of equivalent percentages, fractions and decimals

Objective of the activity: Matching percentages to the equivalent fractions and decimals

The students should be able to do the conversion fast.

Try This!

Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 84 and 85 in Go Get Maths Workbook P5.

Lesson 4
Percentage of a quantity

Lesson objectives
By the end of the lesson, the students should be able to:

1. Find the unknown percentages with given amounts.
2. Find the unknown amounts with given percentages.

Suggested teaching time
4 periods (4 x 50 minutes)

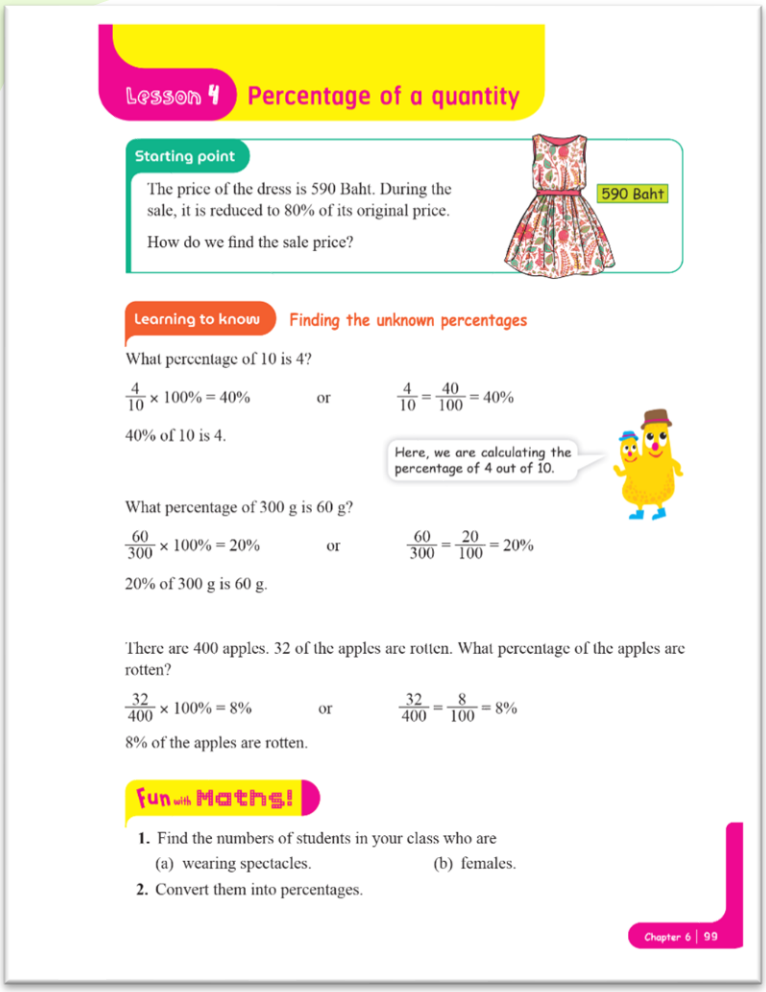
Vocabulary
Percentage

Materials needed
-

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Help the students to understand 'What percentage of 10 is 4?'. Explain that we need to find the percentage of 4 out of 10. Here, 10 will be the 100%. 4 out of 10 is $\frac{4}{10}$. So, we will multiply $\frac{4}{10}$ by 100%.
2. Repeat with other examples.
3. Advise the students to always identify the whole (100%) first.

Fun with Maths!
Materials required: -
Objective of the activity: Finding percentage of classmates wearing spectacles, and percentage of females in the class
The students learn how to use percentages in daily life.



Lesson 4 Percentage of a quantity

Starting point

The price of the dress is 590 Baht. During the sale, it is reduced to 80% of its original price.

How do we find the sale price?

590 Baht

Learning to know Finding the unknown percentages

What percentage of 10 is 4?

$\frac{4}{10} \times 100\% = 40\%$ or $\frac{4}{10} = \frac{40}{100} = 40\%$

40% of 10 is 4.

Here, we are calculating the percentage of 4 out of 10.

What percentage of 300 g is 60 g?

$\frac{60}{300} \times 100\% = 20\%$ or $\frac{60}{300} = \frac{20}{100} = 20\%$

20% of 300 g is 60 g.

There are 400 apples. 32 of the apples are rotten. What percentage of the apples are rotten?

$\frac{32}{400} \times 100\% = 8\%$ or $\frac{32}{400} = \frac{8}{100} = 8\%$

8% of the apples are rotten.

Fun with Maths!

1. Find the numbers of students in your class who are
   (a) wearing spectacles. (b) females.
2. Convert them into percentages.

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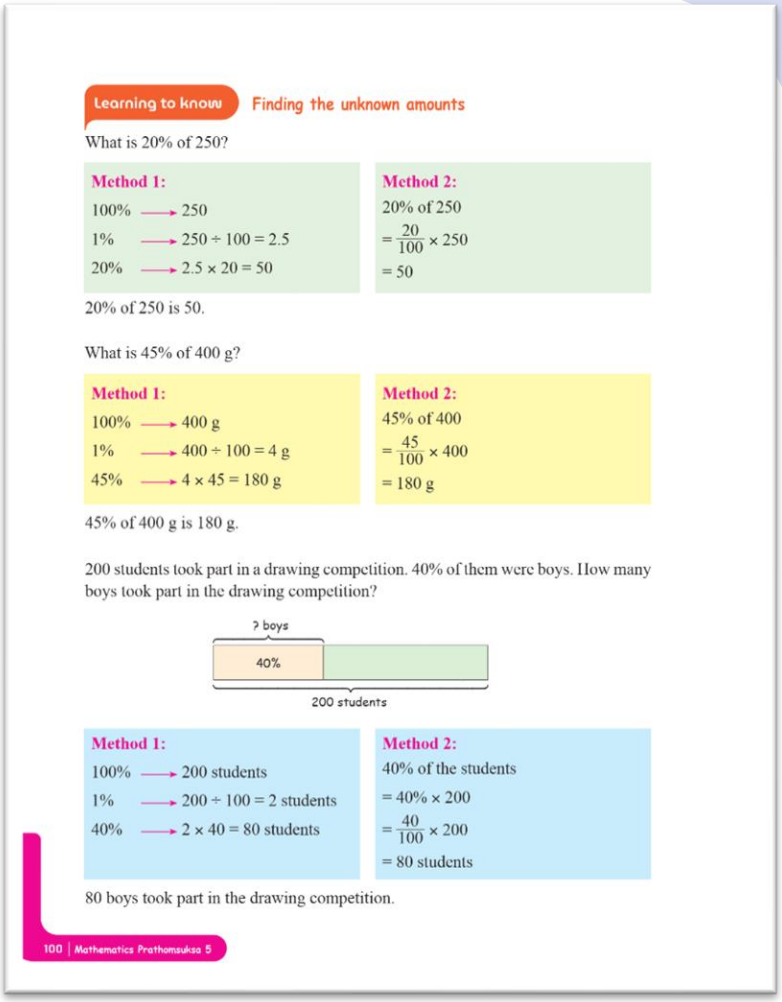
More Info

or visit
http://tiny.cc/k4osuz



Learning to know Finding the unknown amounts

What is 20% of 250?

Method 1:

100% → 250

1% → 250 ÷ 100 = 2.5

20% → 2.5 × 20 = 50

Method 2:

20% of 250

$= \frac{20}{100} \times 250$

= 50

20% of 250 is 50.

What is 45% of 400 g?

Method 1:

100% → 400 g

1% → 400 ÷ 100 = 4 g

45% → 4 × 45 = 180 g

Method 2:

45% of 400

$= \frac{45}{100} \times 400$

= 180 g

45% of 400 g is 180 g.

200 students took part in a drawing competition. 40% of them were boys. How many boys took part in the drawing competition?

Method 1:

100% → 200 students

1% → 200 ÷ 100 = 2 students

40% → 2 × 40 = 80 students

Method 2:

40% of the students

= 40% × 200

$= \frac{40}{100} \times 200$

= 80 students

80 boys took part in the drawing competition.

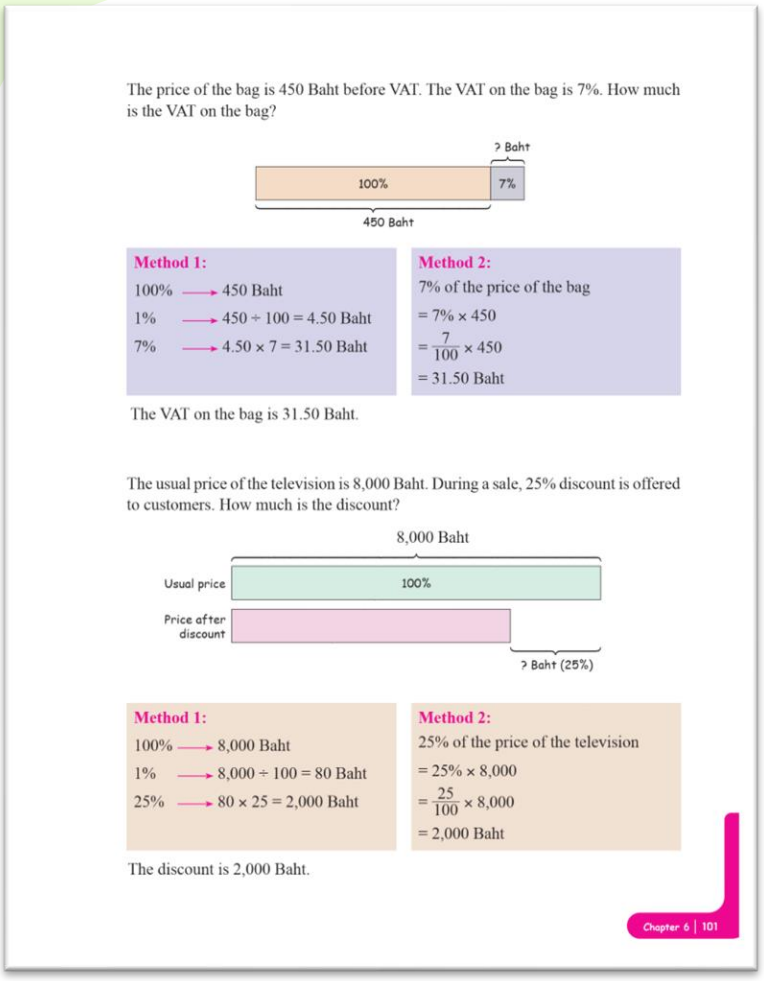
100 | Mathematics Prathomsuksa 5

Teaching ideas

1. Tell the students that we can find the amount when given the percentage.
2. 'What is 20% of 250?' means 250 is the whole (100%), and we need to find the value represented by 20%. Here we can use the Rule of three method or multiply the percentage (in fractional form) by the whole.
3. For the Rule of three method, help the students to recall the first and second quantities that are related.
4. Use the example to explain both methods.
5. Inform the students that they can use a bar model to illustrate the situation for easy understanding.
6. Use the example to explain both methods.

Teaching ideas

7. Tell the students that there are many scenarios involving percentages. So, it is a good idea to have a bar model drawn out to understand better.
8. Guide them through each of the examples, identifying which number represents the whole (100%), and what you need to find.



The price of the bag is 450 Baht before VAT. The VAT on the bag is 7%. How much is the VAT on the bag?

Method 1:

100% → 450 Baht

1% → 450 ÷ 100 = 4.50 Baht

7% → 4.50 × 7 = 31.50 Baht

Method 2:

7% of the price of the bag

$= 7\% \times 450$

$= \frac{7}{100} \times 450$

= 31.50 Baht

The VAT on the bag is 31.50 Baht.

The usual price of the television is 8,000 Baht. During a sale, 25% discount is offered to customers. How much is the discount?

Method 1:

100% → 8,000 Baht

1% → 8,000 ÷ 100 = 80 Baht

25% → 80 × 25 = 2,000 Baht

Method 2:

25% of the price of the television

$= 25\% \times 8{,}000$

$= \frac{25}{100} \times 8{,}000$

= 2,000 Baht

The discount is 2,000 Baht.

Chapter 6 | 101

Mother saves 300,000 Baht in the bank at the begining of the year. The bank gives her 3% interest for 1 year. How much interest does Mother get at the end of the year?

Method 1:

100% ⟶ 300,000 Baht

1% ⟶ 300,000 ÷ 100
= 3,000 Baht

3% ⟶ 3 × 3,000 = 9,000 Baht

Method 2:

3% of the money

$= 3\% \times 300{,}000$

$= \frac{3}{100} \times 300{,}000$

= 9,000 Baht

Mother gets 9,000 Baht at the end of the year.

TRY THIS!

1. Find the percentage of each of the following.
   (a) 30 out of 120 (b) 40 m out of 200 m
   (c) 125 g out of 250 g (d) 560 out of 800
2. Find the value of each of the following.
   (a) 10% of 200 (b) 35% of 600 kg
   (c) 18% of 500 m*l* (d) 80% of 25 m
3. There are 350 vehicles. 140 of the vehicles are cars. What percentage of the vehicles are cars?
4. 100 students out of 125 students attended the exhibition. What percentage of the students attended the exhibition?
5. The storybook has 240 pages. On Monday, Kim read 20% of the book. How many pages did he read on Monday?
6. Mimi's salary is 28,500 Baht. She saves 35% of her salary every month. How much does she save every month?

Teaching ideas

9. Tell the students that there are many scenarios involving percentages. So, it is a good idea to have a bar model drawn out to understand better.
10. Guide them the example, identifying which number represents the whole (100%), and what you need to find.
11. Guide the students to refer to **Starting Point** on page 99. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 12 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 86 to 89 in Go Get Maths Workbook P5.

Lesson 5
Word problems

Lesson objectives
By the end of the lesson, the students should be able to:

1. Solve word problems involving percentages.

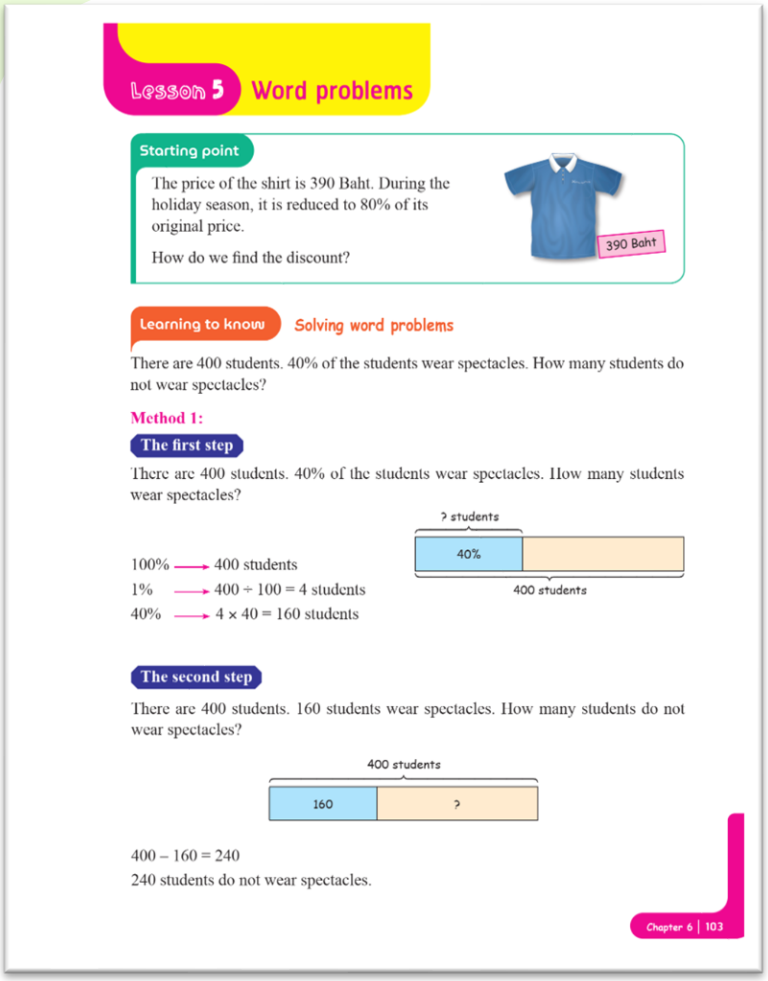
Suggested teaching time
4 periods (4 x 50 minutes)

Vocabulary
-

Materials needed
-

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Inform the students that these word problems involve 2 steps. They need to understand the number story and the question well.
2. For this example, guide the students to use the 3 steps. Set them thinking about these questions:
   a) What do I know?
      - The number of students
      - The percentage of students wearing spectacles
   b) What do I need to find at the end?
      - The number of students not wearing spectacles
   c) What do I need to find out first?
      - The number of students wearing spectacles



Lesson 5 Word problems

Starting point

The price of the shirt is 390 Baht. During the holiday season, it is reduced to 80% of its original price.

How do we find the discount?

390 Baht

Learning to know Solving word problems

There are 400 students. 40% of the students wear spectacles. How many students do not wear spectacles?

Method 1:

The first step

There are 400 students. 40% of the students wear spectacles. How many students wear spectacles?

100% → 400 students
1% → 400 ÷ 100 = 4 students
40% → 4 × 40 = 160 students

? students
40%
400 students

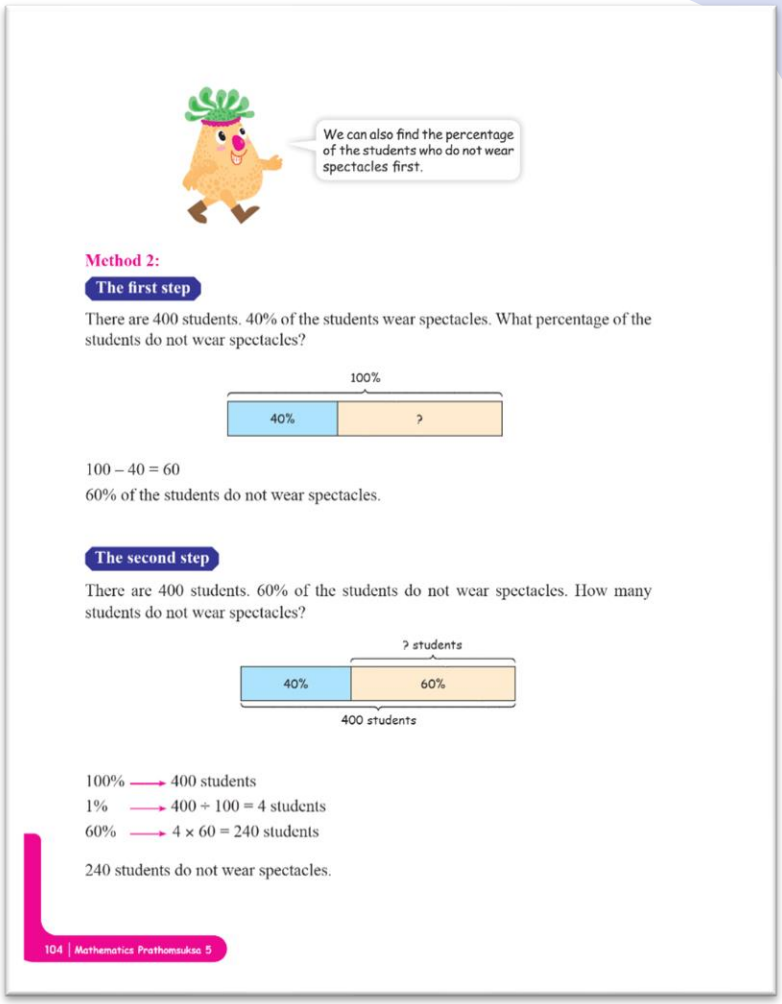
The second step

There are 400 students. 160 students wear spectacles. How many students do not wear spectacles?

400 students
160
?

400 – 160 = 240
240 students do not wear spectacles.

Chapter 6 | 103



Teaching ideas

3. Tell the students that for this example, we can set it as follows

   a) What do I know?
   - The number of students
   - The percentage of students wearing spectacles

   b) What do I need to find at the end?
   - The number of students not wearing spectacles

   c) What do I need to find out first?
   - The percentage of students not wearing spectacles

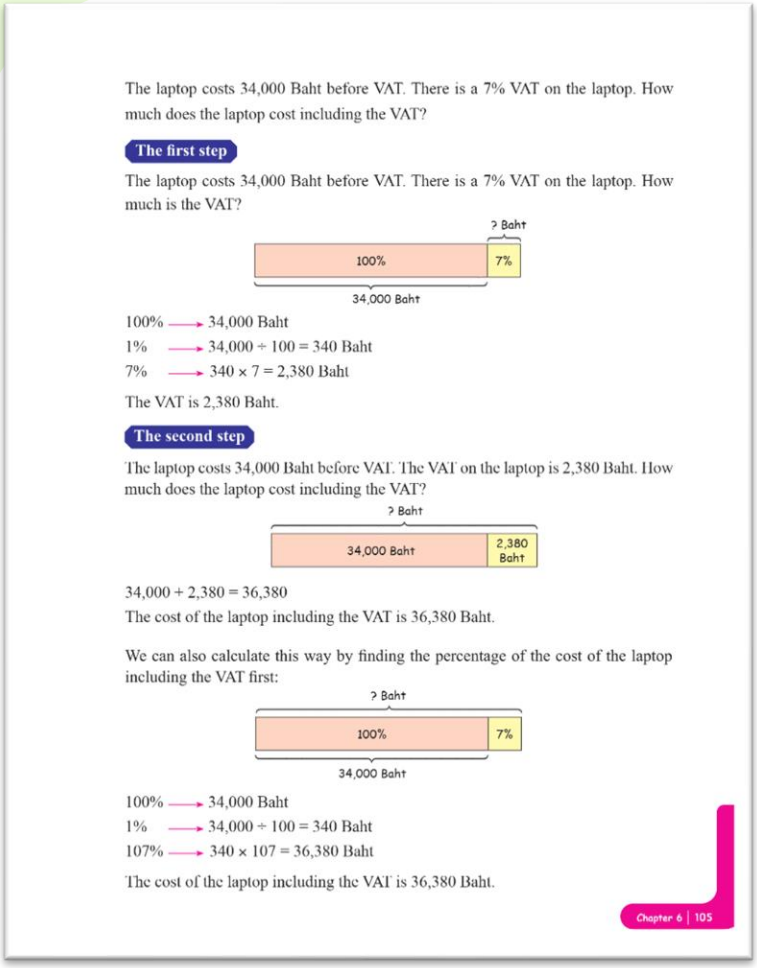
Teaching ideas

4. Tell the students that for this example, we can set it as follows

   a) What do I know?
   - The cost of the laptop before VAT
   - The percentage of VAT

   b) What do I need to find at the end?
   - The cost of the laptop including the VAT

   c) What do I need to find out first?
   - The cost for the VAT



The laptop costs 34,000 Baht before VAT. There is a 7% VAT on the laptop. How much does the laptop cost including the VAT?

The first step

The laptop costs 34,000 Baht before VAT. There is a 7% VAT on the laptop. How much is the VAT?

100% → 34,000 Baht
1% → 34,000 ÷ 100 = 340 Baht
7% → 340 × 7 = 2,380 Baht

The VAT is 2,380 Baht.

The second step

The laptop costs 34,000 Baht before VAT. The VAT on the laptop is 2,380 Baht. How much does the laptop cost including the VAT?

34,000 + 2,380 = 36,380
The cost of the laptop including the VAT is 36,380 Baht.

We can also calculate this way by finding the percentage of the cost of the laptop including the VAT first:

100% → 34,000 Baht
1% → 34,000 ÷ 100 = 340 Baht
107% → 340 × 107 = 36,380 Baht

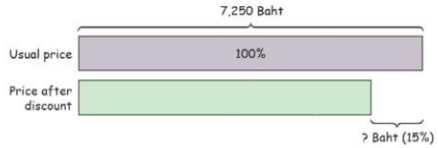
The cost of the laptop including the VAT is 36,380 Baht.

Chapter 6 | 105

The usual price of the sofa was 7,250 Baht. The sofa was sold at a 15% discount. How much was the price after discount?

The first step

The usual price of the sofa was 7,250 Baht. The sofa was sold at a 15% discount. How much was the discount?



100% ⟶ 7,250 Baht

1% ⟶ 7,250 ÷ 100 = 72.50 Baht

15% ⟶ 72.50 × 15 = 1,087.50 Baht

The discount was 1,087.50 Baht.

The second step

The usual price of the sofa was 7,250 Baht. The sofa was sold at a discount of 1,087.50 Baht. How much was the price after discount?

7,250 – 1,087.50 = 6,162.50

The price after discount was 6,162.50 Baht.

Teaching ideas

5. Tell the students that for this example, we can set it as follows

   a) What do I know?
   - The usual price of the sofa
   - The discount percentage

   b) What do I need to find at the end?
   - The price of the sofa after discount

   c) What do I need to find out first?
   - The discount

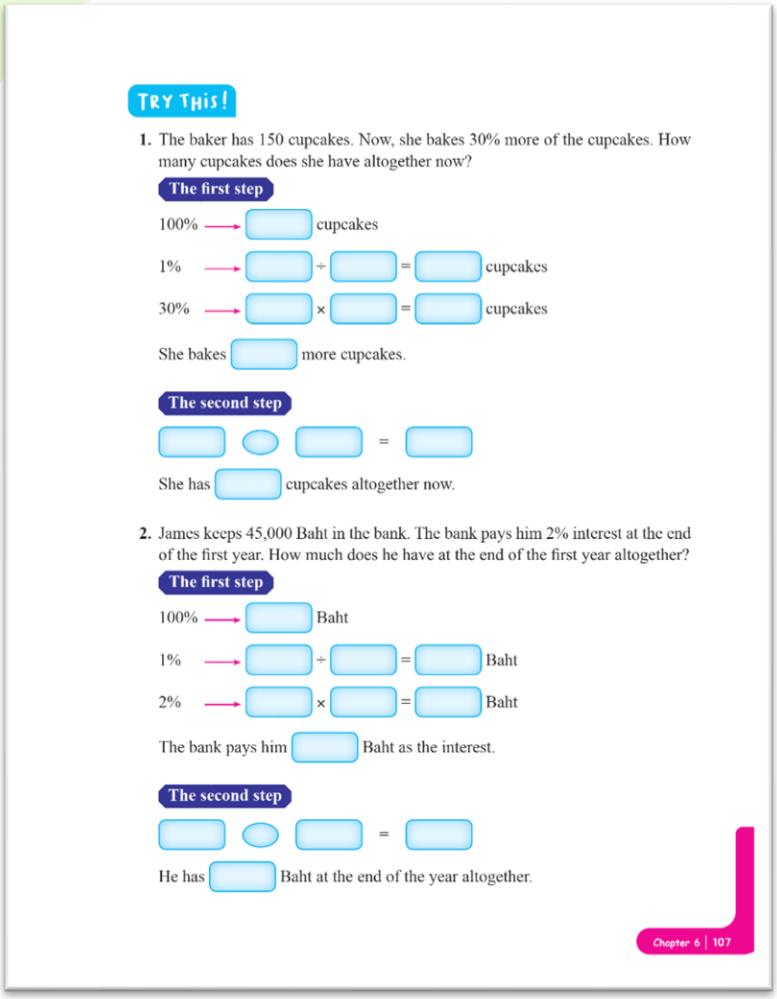
6. Guide the students to refer to **Starting Point** on page 103. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 2 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 90 to 93 in Go Get Maths Workbook P5.



TRY THIS!

1. The baker has 150 cupcakes. Now, she bakes 30% more of the cupcakes. How many cupcakes does she have altogether now?

The first step

100% → ☐ cupcakes

1% → ☐ ÷ ☐ = ☐ cupcakes

30% → ☐ × ☐ = ☐ cupcakes

She bakes ☐ more cupcakes.

The second step

☐ ⬭ ☐ = ☐

She has ☐ cupcakes altogether now.

2. James keeps 45,000 Baht in the bank. The bank pays him 2% interest at the end of the first year. How much does he have at the end of the first year altogether?

The first step

100% → ☐ Baht

1% → ☐ ÷ ☐ = ☐ Baht

2% → ☐ × ☐ = ☐ Baht

The bank pays him ☐ Baht as the interest.

The second step

☐ ⬭ ☐ = ☐

He has ☐ Baht at the end of the year altogether.

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Chapter 7
Units of length and mass

The big idea

1. Ask the students to look at the picture carefully.
2. Ask them these questions to start a discussion:
   a) Do you know what overweight and obese mean?
   b) Is it good to be overweight or obese? Why?
   c) What should we do to have an ideal body mass?
   d) How much did Tom weigh at the beginning?
   e) How much did Tom weigh after 5 months?
   f) Do you notice the units used in Tom's mass are not the same?
   g) Can you find the difference in mass for Tom? How?

Strand 2: Measurement and geometry

Standard M.2.1

Indicators:

M 2.1 Gr5/1 Show mathematical methods of finding the answers of word problems involving length that conversed units of length and written in decimal form.

M 2.1 Gr5/2 Show mathematical methods of finding the answers of word problems involving weight that conversed units of weight and written in decimal form.

Lesson 1
Conversion between units

Lesson objectives
By the end of the lesson, the students should be able to:
1. Convert between units of length.
2. Convert between units of mass.

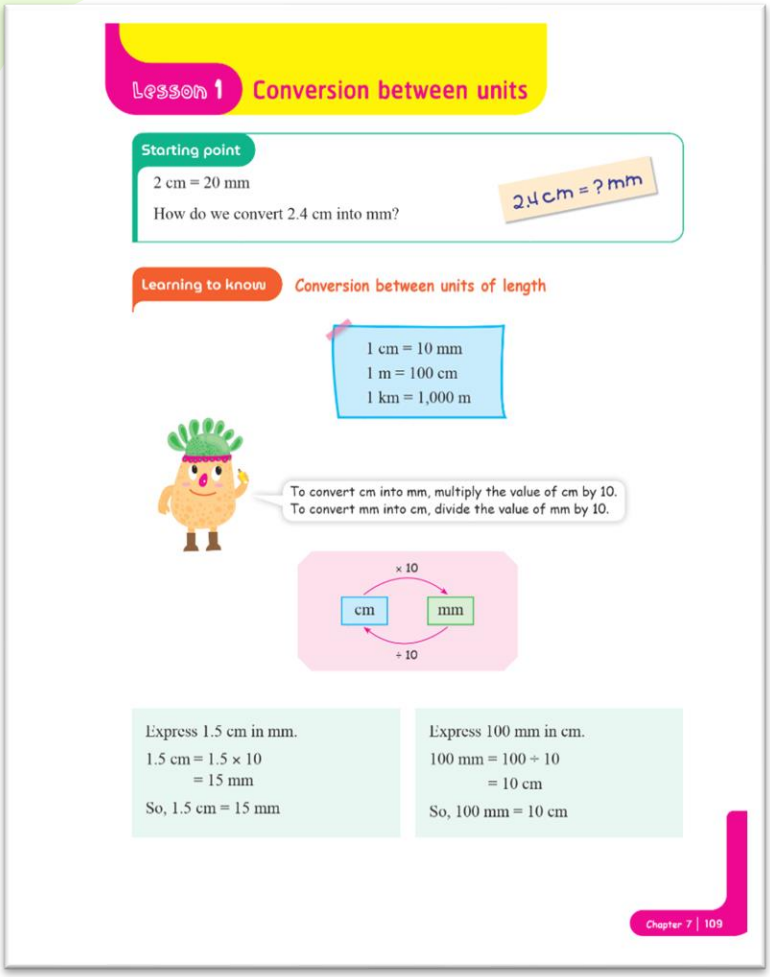
Suggested teaching time
3 periods (3 x 50 minutes)

Vocabulary
cm, m, mm, km, kg, g

Materials needed
Pieces of paper

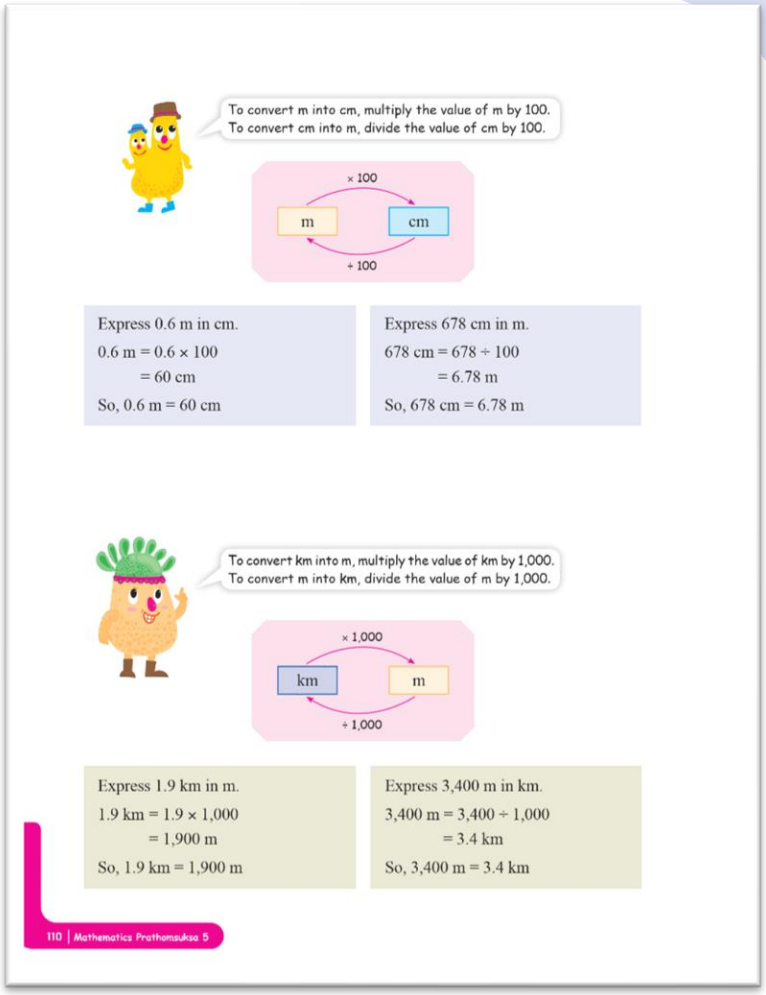
Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Help the students to recall how to convert from one unit of length to the other.
2. Guide them to realize that to convert cm into mm, we need to multiply the value by 10. To convert mm into cm, we need to divide the value by 10.
3. Use the examples to explain.



Activity for Reinforcement
Help the students to recall the conversion of units of length by asking them to fill up the blanks.

a) 1 m = ☐ cm
b) 4 m = ☐ cm
c) 1 cm = ☐ mm
d) 12 cm = ☐ mm
e) 1 km = ☐ m
f) 5 km = ☐ m

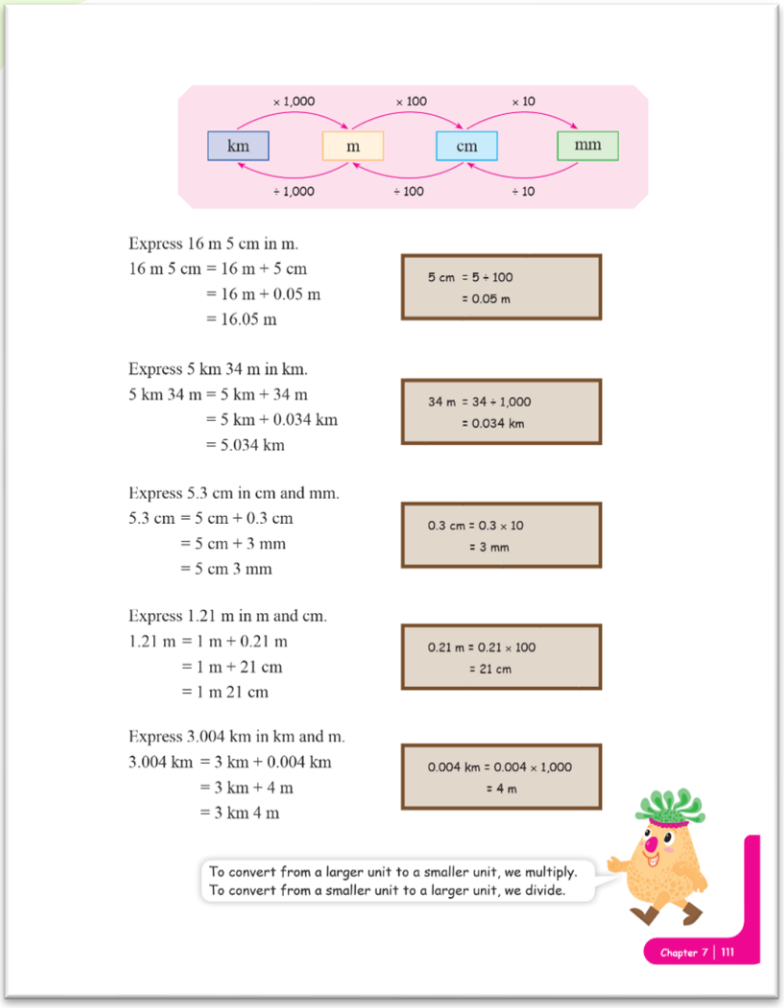


Teaching ideas

4. Guide them to realize that to convert m into cm, we need to multiply the value by 100. To convert cm into m, we need to divide the value by 100.
5. Use the examples to explain.
6. Guide them to realize that to convert km into m, we need to multiply the value by 1,000. To convert m into km, we need to divide the value by 1,000.
7. Use the examples to explain.

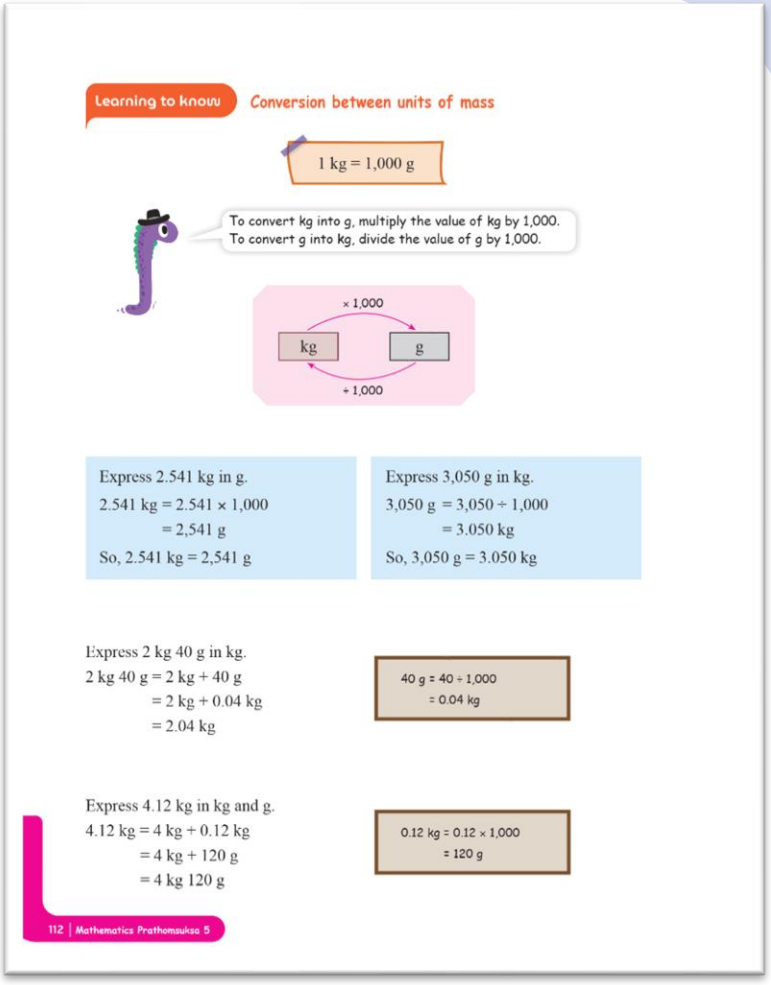
Teaching ideas

8. Use the examples to show how to convert:
   a) cm and mm into cm, and vice versa
   b) m and cm into m, and vice versa
   c) km and m into km, and vice versa
9. Ask the students if they understand when to multiply or divide when converting the units.
10. Tell them that we multiply when we convert from a larger unit into a smaller unit, and divide when we convert from a smaller unit into a larger unit.



More Tasks

or visit
https://wordwall.net/play/33657/730/524



Learning to know Conversion between units of mass

1 kg = 1,000 g

To convert kg into g, multiply the value of kg by 1,000.
To convert g into kg, divide the value of g by 1,000.

× 1,000
kg g
÷ 1,000

Express 2.541 kg in g.
2.541 kg = 2.541 × 1,000
= 2,541 g
So, 2.541 kg = 2,541 g

Express 3,050 g in kg.
3,050 g = 3,050 ÷ 1,000
= 3.050 kg
So, 3,050 g = 3.050 kg

Express 2 kg 40 g in kg.
2 kg 40 g = 2 kg + 40 g
= 2 kg + 0.04 kg
= 2.04 kg

40 g = 40 ÷ 1,000
= 0.04 kg

Express 4.12 kg in kg and g.
4.12 kg = 4 kg + 0.12 kg
= 4 kg + 120 g
= 4 kg 120 g

0.12 kg = 0.12 × 1,000
= 120 g

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Activity for Reinforcement

Help the students to recall the conversion of units of mass by asking them to fill up the blanks.

a) 1 kg = ☐ g
b) 3 kg = ☐ g
c) 5 kg = ☐ g

Teaching ideas

1. Help the students to recall how to convert from one unit of mass to the other.
2. Guide them to realize that to convert kg into g, we need to multiply the value by 1,000. To convert g into kg, we need to divide the value by 1,000.
3. Use the examples to explain.
4. Use the examples to show how to convert kg and g into kg, and vice versa.
5. Ask the students if they understand when to multiply or divide when converting the units.
6. Tell them that we multiply when we convert from a larger unit into a smaller unit, and divide when we convert from a smaller unit into a larger unit.
7. Guide the students to refer to **Starting Point** on page 109. Ask them to answer the question. Have a discussion to conclude the lesson.

More Info
or visit
http://tiny.cc/z4osuz

Fun with Maths!

Materials required: Pieces of paper

Objective of the activity: Converting units of mass and length

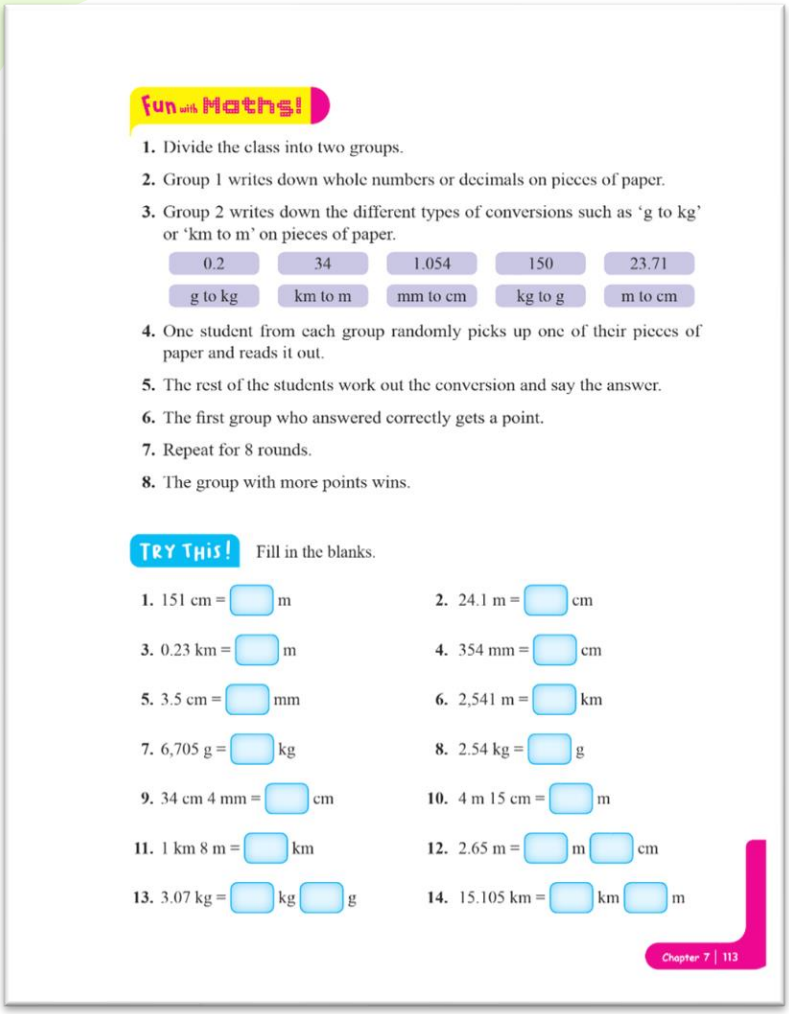
The students should be very familiar with the conversion factors and are able to recall the conversion factor for each conversion.

Try This!

Get 14 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 94 to 99 in Go Get Maths Workbook P5.



Fun with Maths!

1. Divide the class into two groups.
2. Group 1 writes down whole numbers or decimals on pieces of paper.
3. Group 2 writes down the different types of conversions such as 'g to kg' or 'km to m' on pieces of paper.

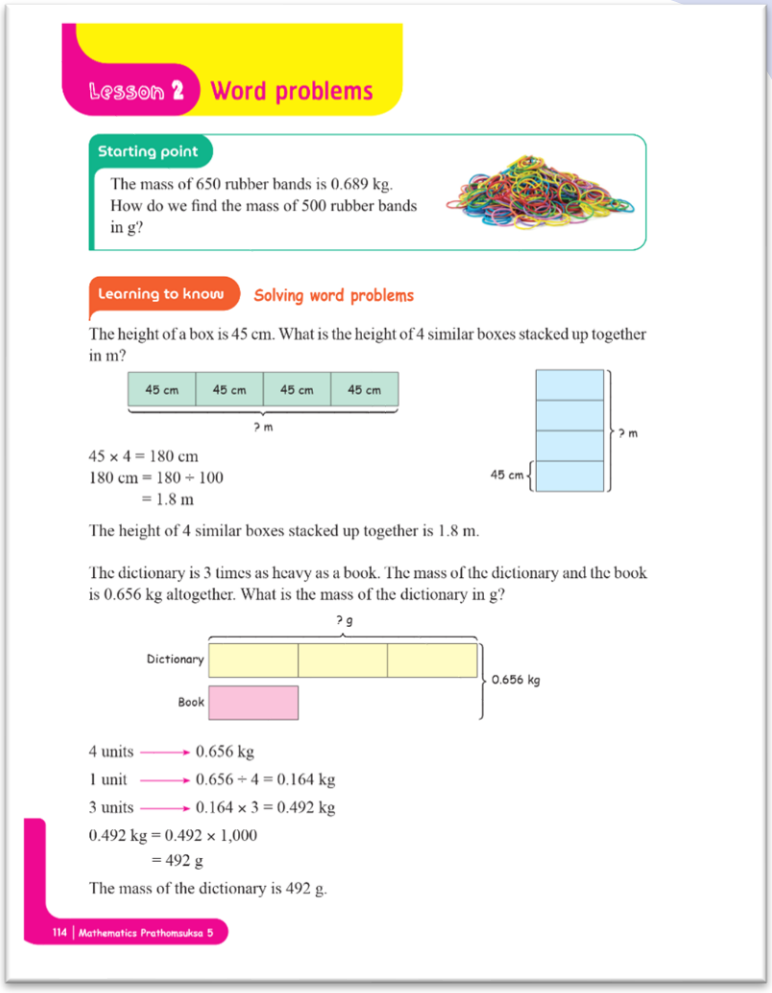
0.2	34	1.054	150	23.71
g to kg	km to m	mm to cm	kg to g	m to cm

4. One student from each group randomly picks up one of their pieces of paper and reads it out.
5. The rest of the students work out the conversion and say the answer.
6. The first group who answered correctly gets a point.
7. Repeat for 8 rounds.
8. The group with more points wins.

TRY THIS! Fill in the blanks.

1. 151 cm = ☐ m
2. 24.1 m = ☐ cm
3. 0.23 km = ☐ m
4. 354 mm = ☐ cm
5. 3.5 cm = ☐ mm
6. 2,541 m = ☐ km
7. 6,705 g = ☐ kg
8. 2.54 kg = ☐ g
9. 34 cm 4 mm = ☐ cm
10. 4 m 15 cm = ☐ m
11. 1 km 8 m = ☐ km
12. 2.65 m = ☐ m ☐ cm
13. 3.07 kg = ☐ kg ☐ g
14. 15.105 km = ☐ km ☐ m

Chapter 7 | 113



Lesson 2 Word problems

Starting point

The mass of 650 rubber bands is 0.689 kg.
How do we find the mass of 500 rubber bands in g?

Learning to know Solving word problems

The height of a box is 45 cm. What is the height of 4 similar boxes stacked up together in m?

45 cm | 45 cm | 45 cm | 45 cm

? m

? m

45 cm

45 × 4 = 180 cm
180 cm = 180 ÷ 100
= 1.8 m

The height of 4 similar boxes stacked up together is 1.8 m.

The dictionary is 3 times as heavy as a book. The mass of the dictionary and the book is 0.656 kg altogether. What is the mass of the dictionary in g?

? g

Dictionary

Book

0.656 kg

4 units → 0.656 kg
1 unit → 0.656 ÷ 4 = 0.164 kg
3 units → 0.164 × 3 = 0.492 kg
0.492 kg = 0.492 × 1,000
= 492 g

The mass of the dictionary is 492 g.

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Lesson 2
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving length and mass.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Reiterate the 3 simple steps to solve a word problem.

   Step 1: Understand the problem

   - Ask the students to read the number story and the question silently. Then, read them together with the students. Explain further the number story and the question if the students do not understand.
   - Ask the students these questions to ensure they understand:
     - What information is given?
     - What do you need to find?
     - Are you comparing the items?

Teaching ideas

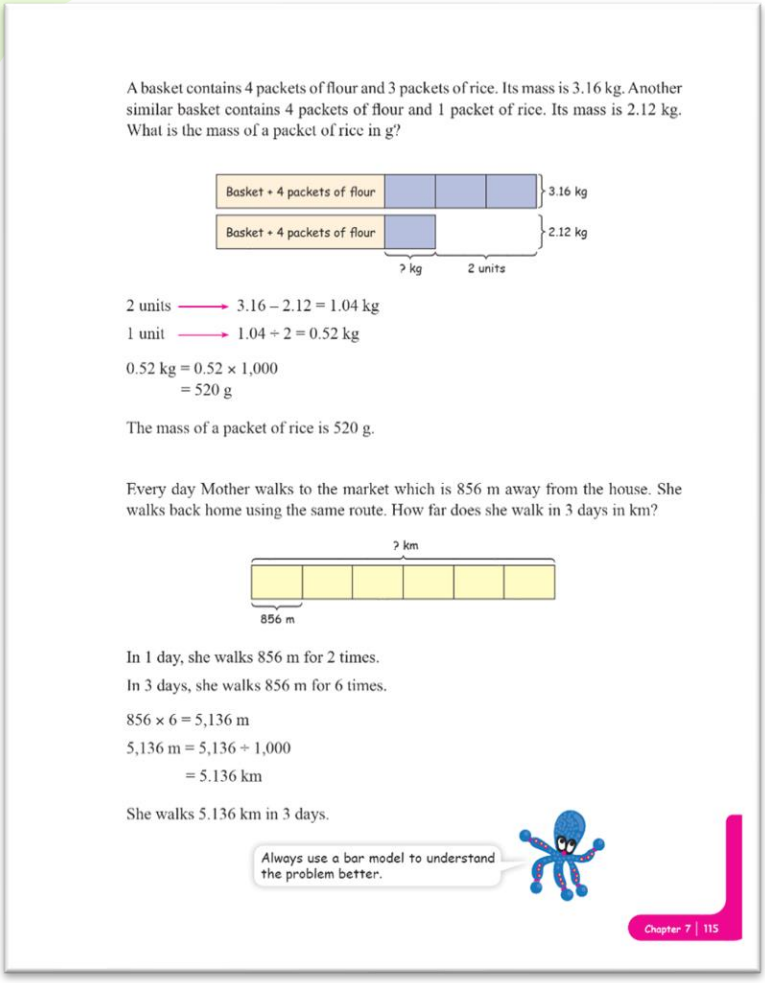
Step 2: Plan and execute

- Ask the students to draw the suitable bar model including the knowns and unknowns.
- Ask them to find the keyword in the problem that indicates the operation whether to add, to subtract, to multiply or to divide.
- Analyze the bar model drawn.
- Then, write the number equation and solve it.

Step 3: Check the answer

- Always ask the students to check their answer. They need to check if the answer makes sense and is reasonable.

2. Remind the students to always take note of the units.
3. Work with them the 3 steps in solving the word problems.
4. Guide the students to refer to **Starting Point** on page 114. Ask them to answer the question. Have a discussion to conclude the lesson.



A basket contains 4 packets of flour and 3 packets of rice. Its mass is 3.16 kg. Another similar basket contains 4 packets of flour and 1 packet of rice. Its mass is 2.12 kg. What is the mass of a packet of rice in g?

2 units ⟶ 3.16 – 2.12 = 1.04 kg

1 unit ⟶ 1.04 ÷ 2 = 0.52 kg

0.52 kg = 0.52 × 1,000
= 520 g

The mass of a packet of rice is 520 g.

Every day Mother walks to the market which is 856 m away from the house. She walks back home using the same route. How far does she walk in 3 days in km?

In 1 day, she walks 856 m for 2 times.

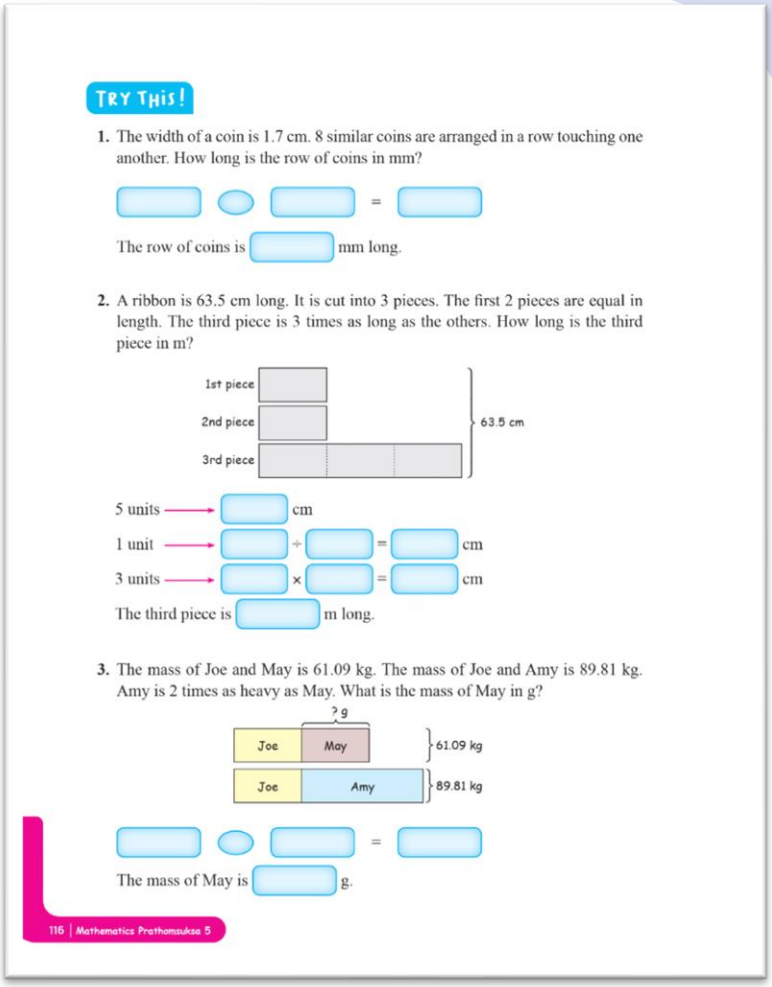
In 3 days, she walks 856 m for 6 times.

856 × 6 = 5,136 m

5,136 m = 5,136 ÷ 1,000
= 5.136 km

She walks 5.136 km in 3 days.

Chapter 7 | 115



TRY THIS!

1. The width of a coin is 1.7 cm. 8 similar coins are arranged in a row touching one another. How long is the row of coins in mm?

□ ○ □ = □

The row of coins is □ mm long.

2. A ribbon is 63.5 cm long. It is cut into 3 pieces. The first 2 pieces are equal in length. The third piece is 3 times as long as the others. How long is the third piece in m?

5 units → □ cm

1 unit → □ ÷ □ = □ cm

3 units → □ × □ = □ cm

The third piece is □ m long.

3. The mass of Joe and May is 61.09 kg. The mass of Joe and Amy is 89.81 kg. Amy is 2 times as heavy as May. What is the mass of May in g?

□ ○ □ = □

The mass of May is □ g.

Try This!

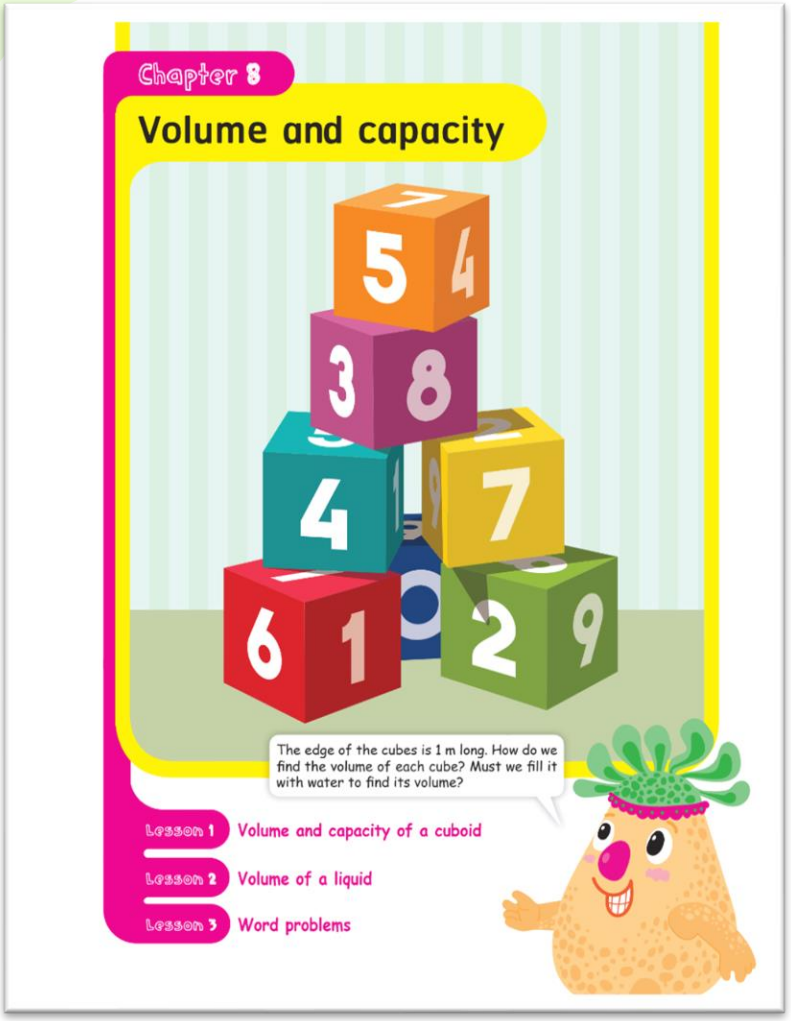
Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 100 to 103 in Go Get Maths Workbook P5.

To find out if the students have mastered the first half of the year's content, ask them to complete the **Revision 1** on pages 104 to 114 in Go Get Maths Workbook P5.

Chapter 8
Volume and capacity



The big idea

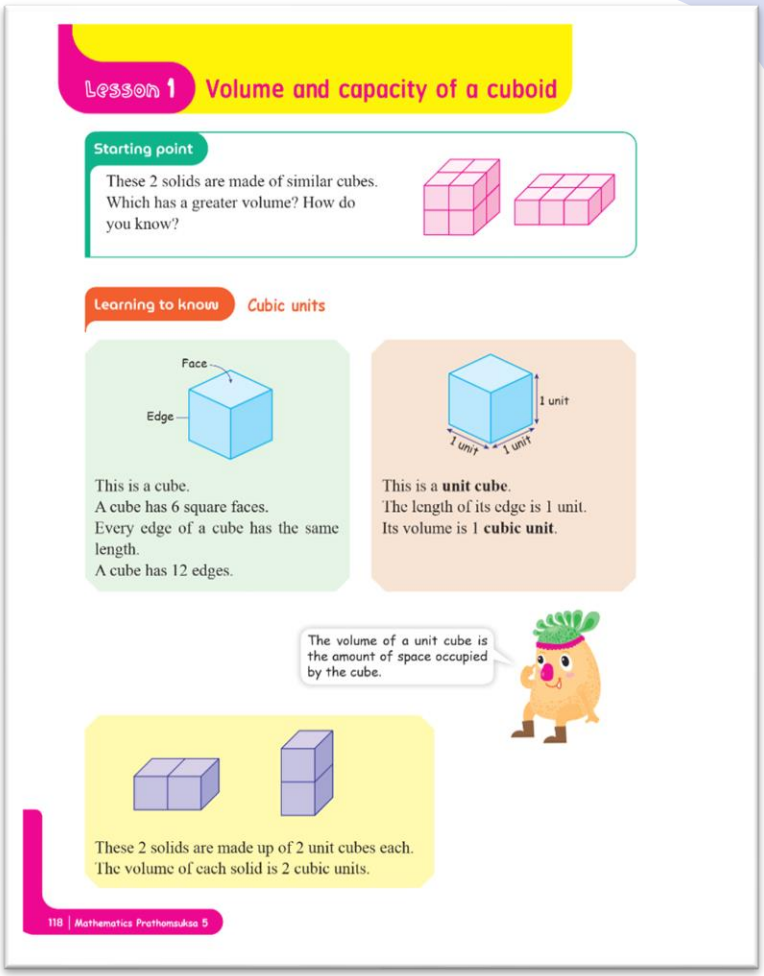
1. Ask the students these questions about volume and capacity to start a discussion:
   a) What is volume of a liquid?
   b) What is capacity of a container?
   c) How do we measure the volume of some water?
   d) How do we measure the capacity of a pail?
2. Ask the students to look at the picture carefully. Ask them these questions to start a discussion:
   a) Does a cube have a volume?
   b) How do we measure the volume of a cube?
   c) Must we pour water into it to measure its volume?
   d) Is there other way to find the volume of a cube?

Strand 2: Measurement and geometry

Standard M.2.1

Indicators:

M 2.1 Gr5/3 Show mathematical methods of finding the answers of word problems involving volume and capacity of cuboids.



Lesson 1 Volume and capacity of a cuboid

Starting point

These 2 solids are made of similar cubes. Which has a greater volume? How do you know?

Learning to know Cubic units

Face
Edge

This is a cube.
A cube has 6 square faces.
Every edge of a cube has the same length.
A cube has 12 edges.

1 unit
1 unit
1 unit

This is a **unit cube**.
The length of its edge is 1 unit.
Its volume is 1 **cubic unit**.

The volume of a unit cube is the amount of space occupied by the cube.

These 2 solids are made up of 2 unit cubes each.
The volume of each solid is 2 cubic units.

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Activity for Reinforcement

Help the students to recall what a cube is by asking them these questions:

1. Is a cube a 3D shape?
2. How many faces does a cube have?
3. What is the shape of the faces of a cube?
4. How many edges does a cube have?
5. Do the edges of a cube have the same length?
6. How does a cube and a cuboid differ?

Ask them to draw a cube.

Lesson 1 Volume and capacity of a cuboid

Lesson objectives

By the end of the lesson, the students should be able to:

1. Understand cubic units, cubic centimeters and cubic meters.
2. Find the volume and capacity of cubes and cuboids.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Unit cube, cubic unit, cubic meter, cubic centimeter, volume, capacity

Materials needed

Cubes, paper, masking tapes, adhesive putties, rules

Starting point

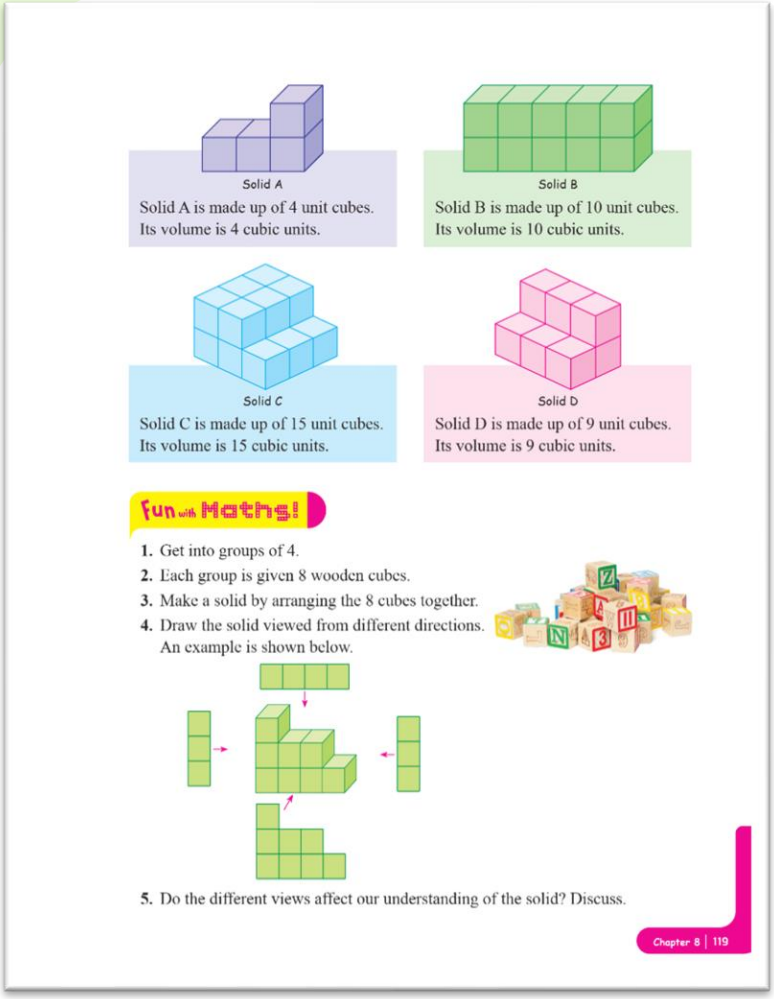
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Help the students to recall what a cube is. Show them a cube. Get a volunteer to describe its properties.
2. Help the students to recall what volume is. Volume is the measurement of how much space an object takes up.
3. Guide them to understand what a unit cube is and its volume or the space taken up by it is 1 cubic unit.
4. Show them a solid made of 2 unit cubes and ask for its volume

Teaching ideas

5. Guide them to find the volumes of the solids made of unit cubes. Make them realize that they need to count the number of cubes that make up the solid.
6. Use the examples to explain more.



Solid A

Solid A is made up of 4 unit cubes.
Its volume is 4 cubic units.

Solid B

Solid B is made up of 10 unit cubes.
Its volume is 10 cubic units.

Solid C

Solid C is made up of 15 unit cubes.
Its volume is 15 cubic units.

Solid D

Solid D is made up of 9 unit cubes.
Its volume is 9 cubic units.

Fun with Maths!

1. Get into groups of 4.
2. Each group is given 8 wooden cubes.
3. Make a solid by arranging the 8 cubes together.
4. Draw the solid viewed from different directions.
   An example is shown below.

5. Do the different views affect our understanding of the solid? Discuss.

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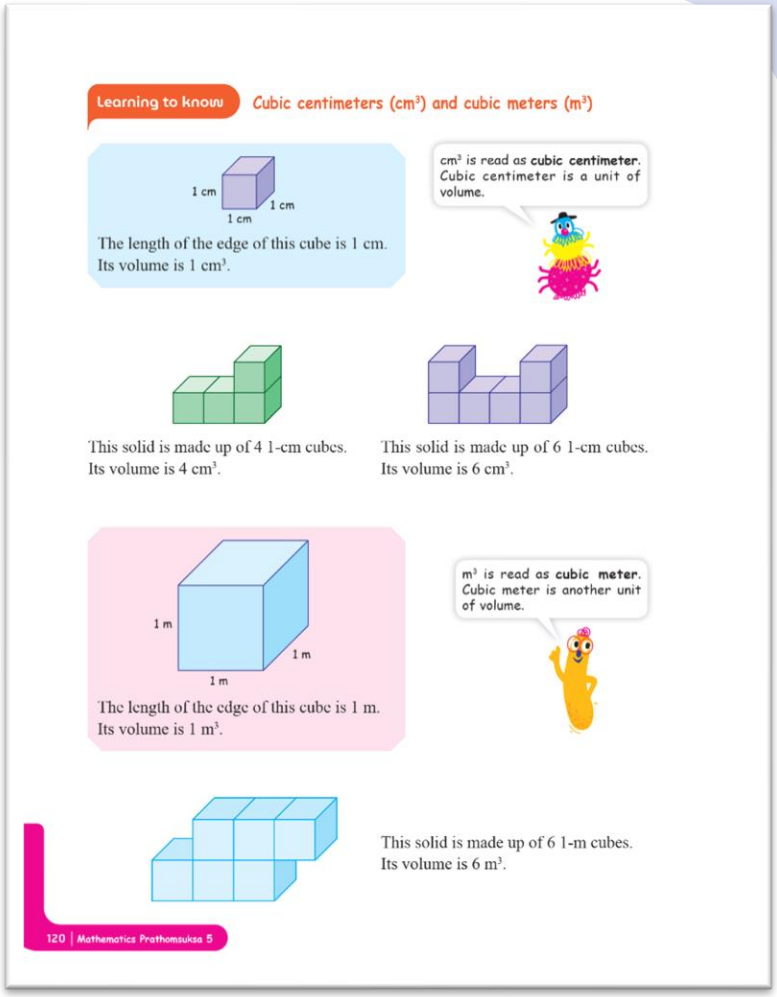
Fun with Maths!

Materials required: Wooden cubes

Objective of the activity: Making plans and elevations of solids made of cubes

This can help the students to improve their spatial skills by being able to do mental rotations in their head and visualizing objects from different perspectives.



Teaching ideas

1. Show the students a cube with 1 cm edge. Tell them that the space it takes up is 1 cubic centimeter. Emphasize that cm^3 is a unit of volume and read as cubic centimeter.
2. Guide them to find the volumes of the solids made of 1-cm cubes. Make them realize that they need to count the number of cubes that make up the solids too.
3. Use the examples to explain more.
4. Ask them to think if a cube has 1-m edges. What will its volume be?
5. Introduce cubic meter, m^3 as a unit of volume.
6. Guide them to find the volumes of the solids made of 1-m cubes. Make them realize that they need to count the number of cubes that make up the solids too.

Teaching ideas

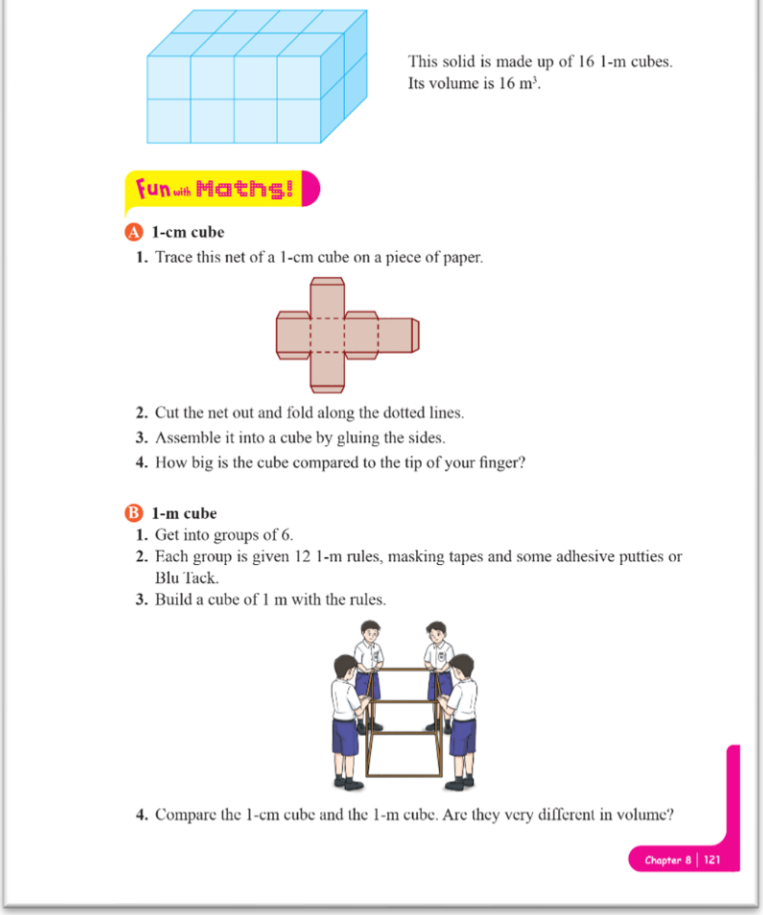
7. Use the example to explain more.

Fun with Maths!

Materials required: Paper, masking tapes, adhesive putties, rules

Objective of the activity: Making a 1-cm cube and a 1-m cube

The students will have an idea how much is 1 cm^3 and 1 m^3.



This solid is made up of 16 1-m cubes.
Its volume is 16 m^3.

Fun with Maths!

A 1-cm cube

1. Trace this net of a 1-cm cube on a piece of paper.

2. Cut the net out and fold along the dotted lines.
3. Assemble it into a cube by gluing the sides.
4. How big is the cube compared to the tip of your finger?

B 1-m cube

1. Get into groups of 6.
2. Each group is given 12 1-m rules, masking tapes and some adhesive putties or Blu Tack.
3. Build a cube of 1 m with the rules.

4. Compare the 1-cm cube and the 1-m cube. Are they very different in volume?

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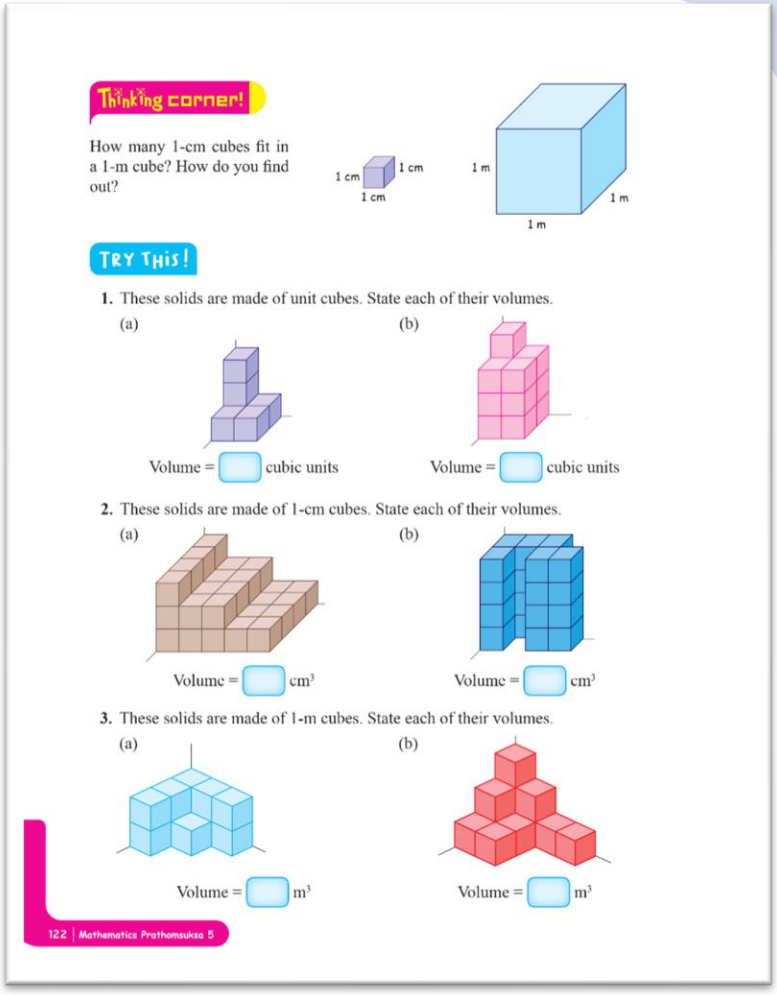

Thinking corner!

How many 1-cm cubes fit in a 1-m cube? How do you find out?

1 cm 1 cm 1 cm

1 m 1 m 1 m

TRY THIS!

1. These solids are made of unit cubes. State each of their volumes.

(a) Volume = ☐ cubic units

(b) Volume = ☐ cubic units

2. These solids are made of 1-cm cubes. State each of their volumes.

(a) Volume = ☐ cm^3

(b) Volume = ☐ cm^3

3. These solids are made of 1-m cubes. State each of their volumes.

(a) Volume = ☐ m^3

(b) Volume = ☐ m^3

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Thinking Corner!

Ask the students these questions:

a) How many 1-cm cubes are needed to make a line along each edge of the 1-m cube?

b) How many 1-cm cubes are needed to make a layer of cubes that can fit into the 1-m cube?

c) How many similar layers of 1-cm cubes are needed to fill up the 1-m cube?

d) How many 1-cm cubes are needed to fill up the 1-m cube?

Try This!

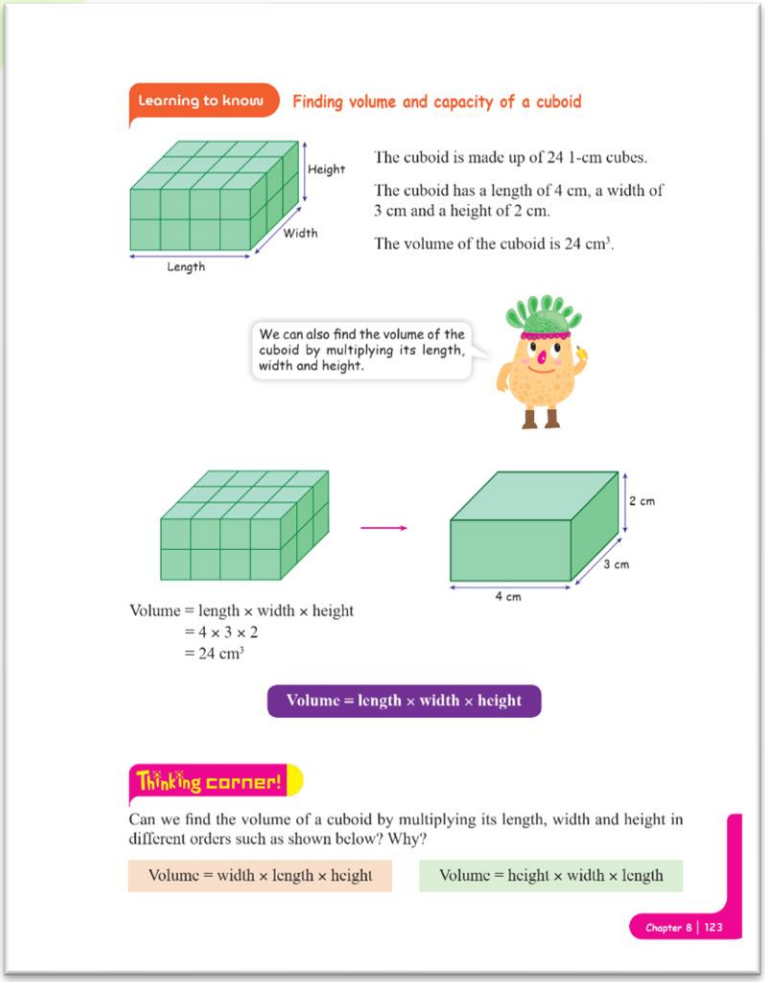
Get 6 students to answer it. Ask the rest to verify the answers.

Further practices

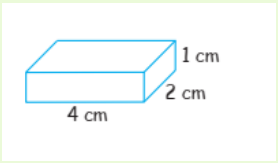
Get the students to complete the practices on pages 115 to 117 in Go Get Maths Workbook P5.

Teaching ideas

1. Use some unit cubes to make a cuboid. Guide them to find the number of cubes that make up the cuboid. They can either count the cubes or multiply the length, width and height of the cuboid. Both give the same answer.
2. Use the example to explain further.
3. Highlight to the students that we can find volume of a cuboid by multiplying its length, width and height.



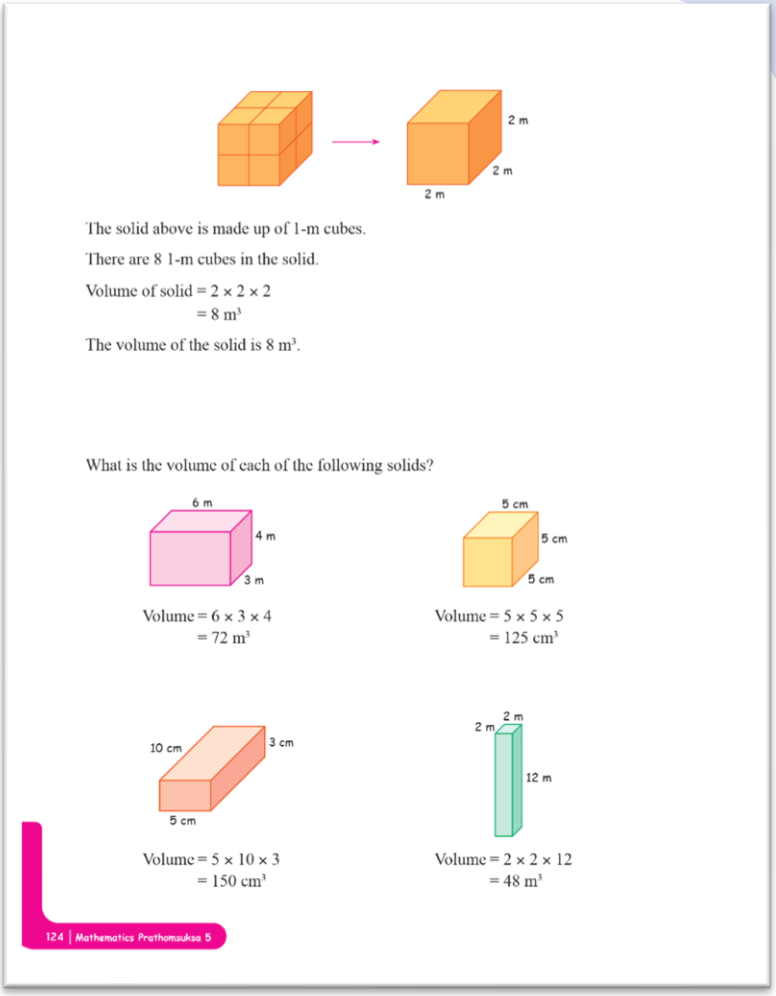
Thinking Corner!



Ask the students to find the volume of the above cuboid by

a) multiplying its length, width and height
b) multiplying its length, height, and width
c) multiplying its width, length, and height
d) multiplying its width, height, and length
e) multiplying its height, length and width
f) multiplying its height, width and length

Are the answers the same? Ask them to explain the commutative property of multiplication.



Teaching ideas

4. Use the examples to explain how to find the volumes of cubes and cuboids.
5. Reiterate that the order of multiplication is not important. It is also not important to identify which is the length, width or height.
6. Ask them to take note of the units.

Teaching ideas

7. Using the example in the book, explain to the students that they need to find the length, width and height of the rectangular glass container. They can count the number of 1-cm cubes used to make the length, width and height.
8. Guide the students to refer to **Starting Point** on page 118. Ask them to answer the questions. Have a discussion to conclude the lesson.

Thinking Corner!

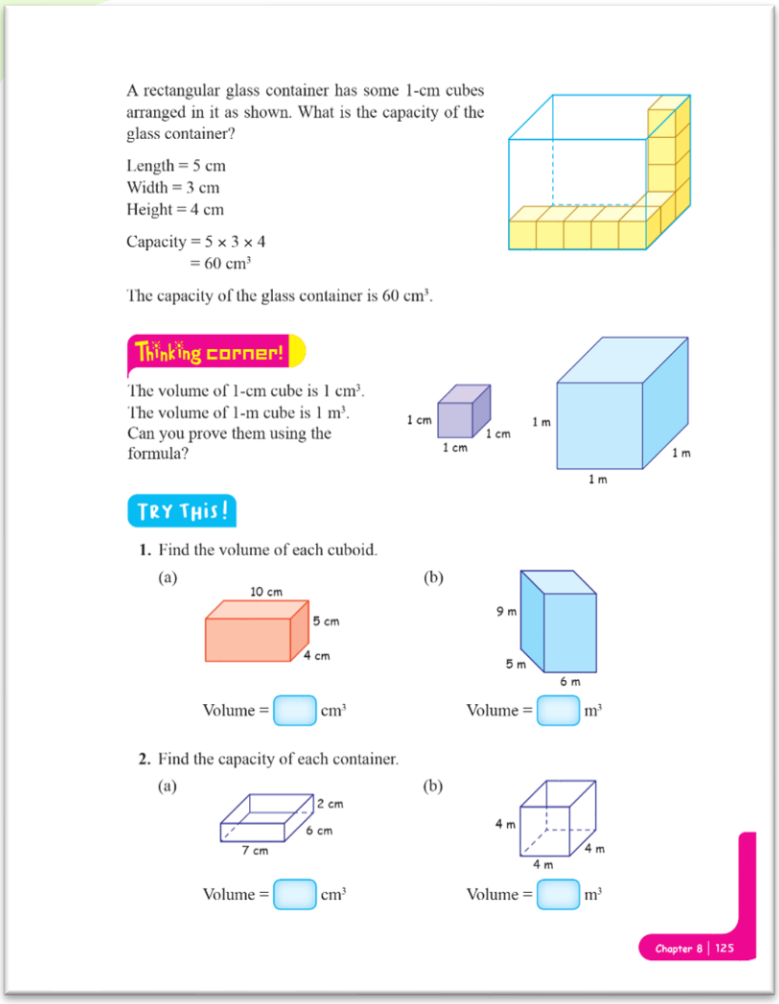
Ask the students to multiply to get the volumes of a 1-cm cube and a 1-m cube.

Try This!

Get 4 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 118 to 120 in Go Get Maths Workbook P5.



A rectangular glass container has some 1-cm cubes arranged in it as shown. What is the capacity of the glass container?

Length = 5 cm
Width = 3 cm
Height = 4 cm

Capacity = 5 × 3 × 4
= 60 cm³

The capacity of the glass container is 60 cm³.

Thinking corner!

The volume of 1-cm cube is 1 cm³.
The volume of 1-m cube is 1 m³.
Can you prove them using the formula?

1 cm 1 cm 1 cm

1 m 1 m 1 m

TRY THIS!

1. Find the volume of each cuboid.

(a) 10 cm, 5 cm, 4 cm

Volume = ☐ cm³

(b) 9 m, 5 m, 6 m

Volume = ☐ m³

2. Find the capacity of each container.

(a) 2 cm, 6 cm, 7 cm

Volume = ☐ cm³

(b) 4 m, 4 m, 4 m

Volume = ☐ m³

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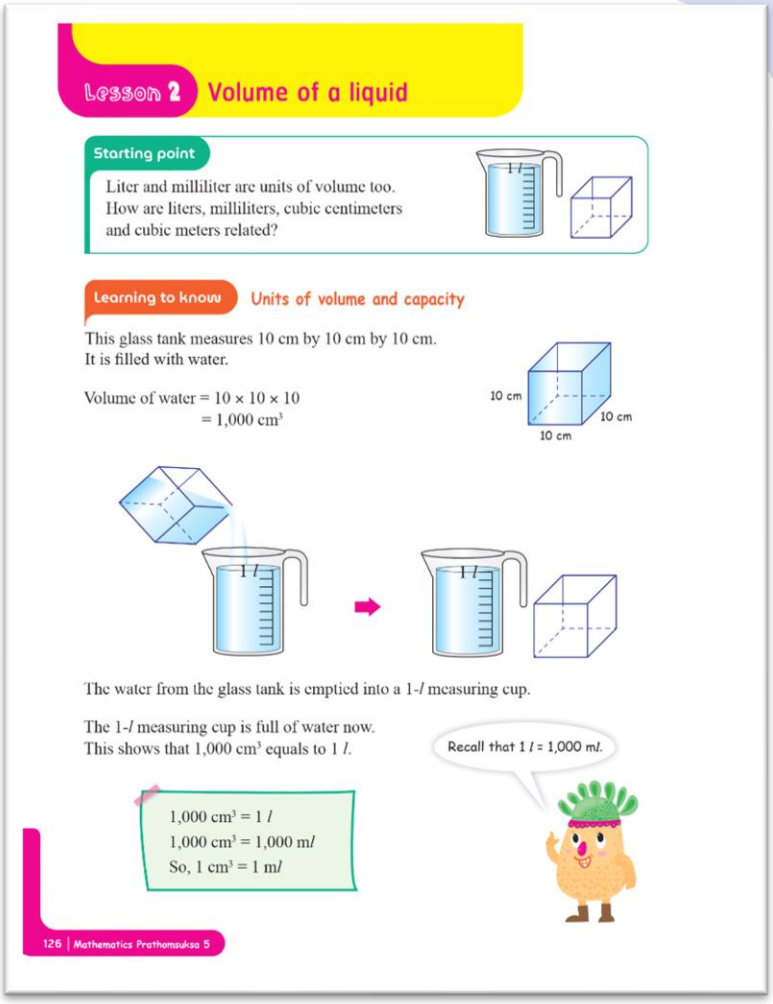
More Tasks

or visit
https://wordwall.net/play/33599/288/303



Lesson 2 Volume of a liquid

Starting point

Liter and milliliter are units of volume too.
How are liters, milliliters, cubic centimeters and cubic meters related?

Learning to know Units of volume and capacity

This glass tank measures 10 cm by 10 cm by 10 cm.
It is filled with water.

Volume of water = 10 × 10 × 10
= 1,000 cm³

10 cm
10 cm
10 cm

The water from the glass tank is emptied into a 1-*l* measuring cup.

The 1-*l* measuring cup is full of water now.
This shows that 1,000 cm³ equals to 1 *l*.

Recall that 1 *l* = 1,000 m*l*.

1,000 cm³ = 1 *l*
1,000 cm³ = 1,000 m*l*
So, 1 cm³ = 1 m*l*

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Lesson 2
Volume of a liquid

Lesson objectives

By the end of the lesson, the students should be able to:

1. Identify the units of volume.
2. Convert between units of volume.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Liter, milliliter, cubic centimeter, cubic meter

Materials needed

-

Starting point

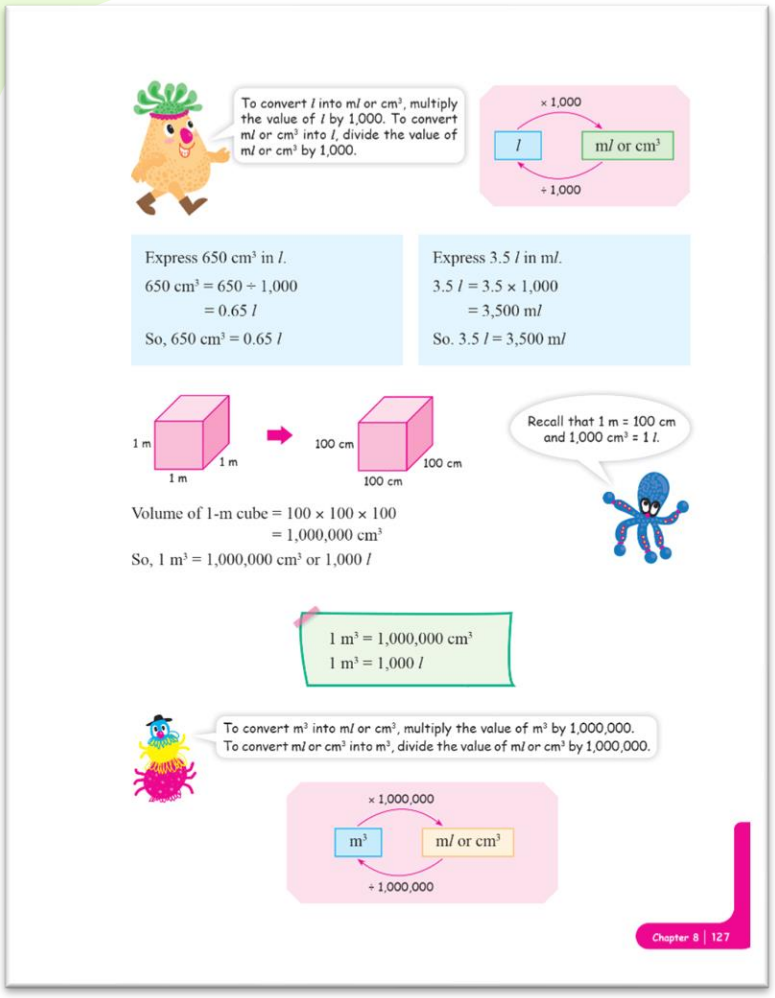
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

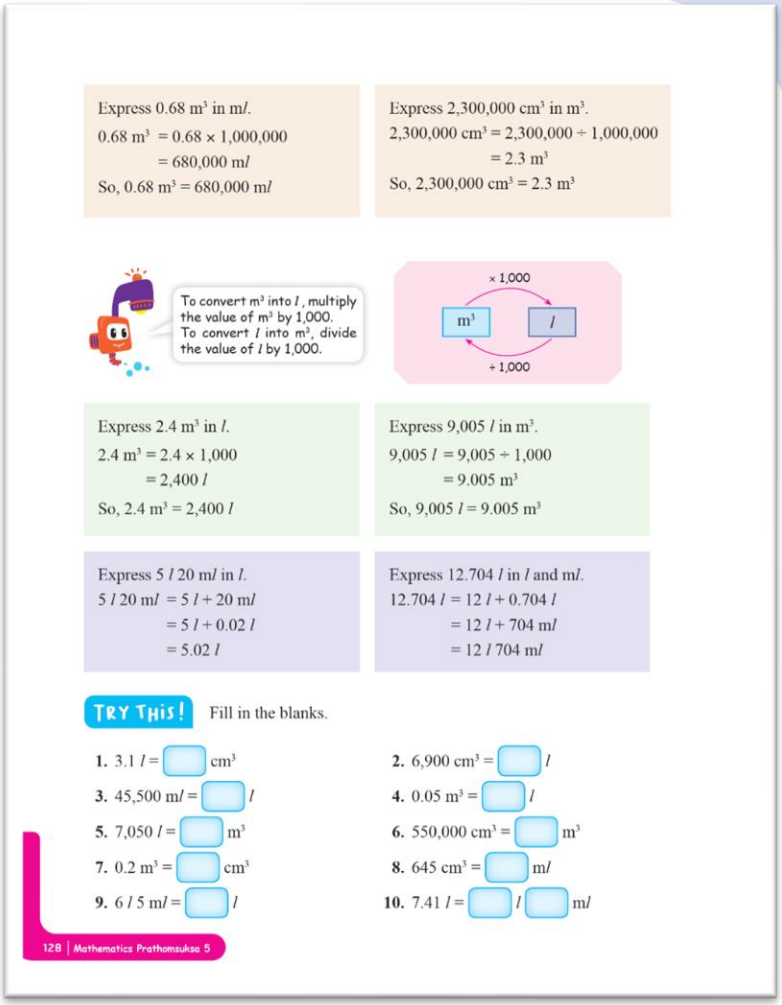
Teaching ideas

1. Use this part to explain that 1,000 cm^3 is equal to 1 ℓ.
2. Guide them to understand that 1 ℓ = 1,000 mℓ and 1 ℓ = 1,000 cm^3, so 1,000 mℓ = 1,000 cm^3. Therefore, 1 cm^3 = 1 mℓ.

Teaching ideas

3. Guide them to realize that to convert ℓ into cm^3, we need to multiply the value by 1,000. To convert cm^3 into ℓ, we need to divide the value by 1,000.
4. Use the examples to explain.
5. Use this part to explain that 1 m^3 is equal to 1,000,000 cm^3.
6. Guide them to realize that to convert m^3 into $m\ell$ or cm^3, we need to multiply the value by 1,000,000. To convert $m\ell$ or cm^3 into m^3, we need to divide the value by 1,000,000.





Express 0.68 m^3 in $m\ell$.
0.68 m^3 = 0.68 × 1,000,000
= 680,000 $m\ell$
So, 0.68 m^3 = 680,000 $m\ell$

Express 2,300,000 cm^3 in m^3.
2,300,000 cm^3 = 2,300,000 ÷ 1,000,000
= 2.3 m^3
So, 2,300,000 cm^3 = 2.3 m^3

Express 2.4 m^3 in ℓ.
2.4 m^3 = 2.4 × 1,000
= 2,400 ℓ
So, 2.4 m^3 = 2,400 ℓ

Express 9,005 ℓ in m^3.
9,005 ℓ = 9,005 ÷ 1,000
= 9.005 m^3
So, 9,005 ℓ = 9.005 m^3

Express 5 ℓ 20 $m\ell$ in ℓ.
5 ℓ 20 $m\ell$ = 5 ℓ + 20 $m\ell$
= 5 ℓ + 0.02 ℓ
= 5.02 ℓ

Express 12.704 ℓ in ℓ and $m\ell$.
12.704 ℓ = 12 ℓ + 0.704 ℓ
= 12 ℓ + 704 $m\ell$
= 12 ℓ 704 $m\ell$

TRY THIS! Fill in the blanks.

1. 3.1 ℓ = ☐ cm^3
2. 6,900 cm^3 = ☐ ℓ
3. 45,500 $m\ell$ = ☐ ℓ
4. 0.05 m^3 = ☐ ℓ
5. 7,050 ℓ = ☐ m^3
6. 550,000 cm^3 = ☐ m^3
7. 0.2 m^3 = ☐ cm^3
8. 645 cm^3 = ☐ $m\ell$
9. 6 ℓ 5 $m\ell$ = ☐ ℓ
10. 7.41 ℓ = ☐ ℓ ☐ $m\ell$

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Teaching ideas

7. Use the examples to explain.
8. Guide them to realize that to convert m^3 into ℓ, we need to multiply the value by 1,000. To convert ℓ into m^3, we need to divide the value by 1,000.
9. Use the examples to explain.
10. Guide the students to refer to **Starting Point** on page 126. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 10 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 121 and 122 in Go Get Maths Workbook P5

Lesson 3
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving volume and capacity.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

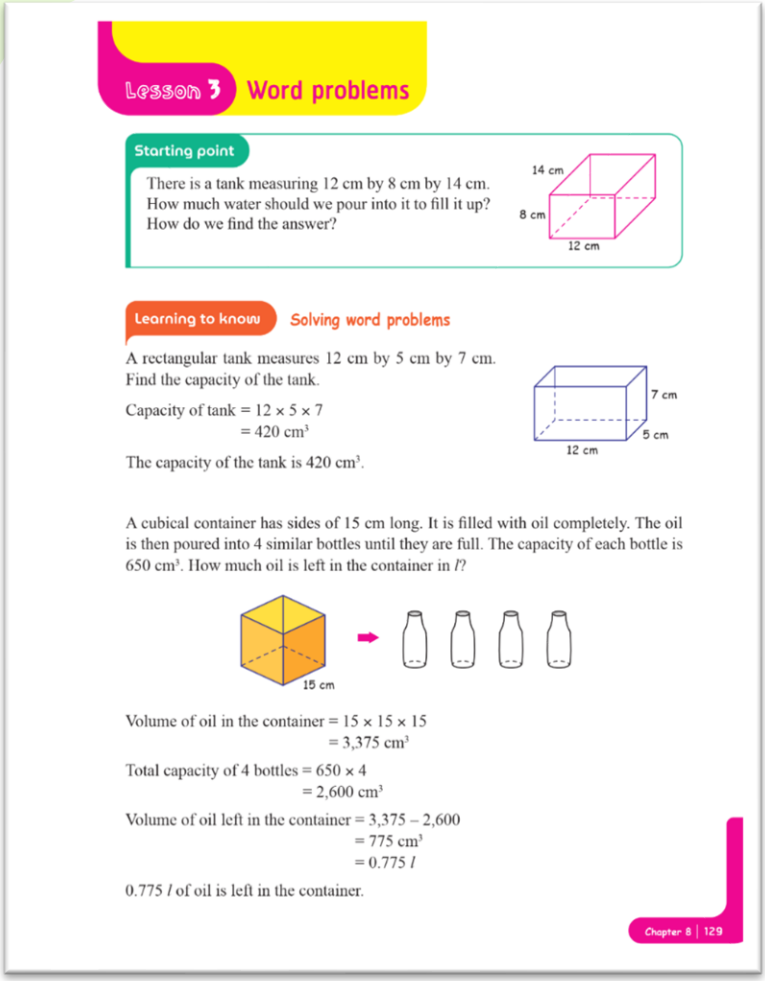
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Reiterate the 3 simple steps to solve a word problem.

   Step 1: Understand the problem

   - Ask the students to read the number story and the question silently. Then, read them together with the students. Explain further the number story and the question if the students do not understand.
   - Ask the students these questions to ensure they understand:
     - What information is given?
     - What do you need to find?
     - Are you comparing the items?



Lesson 3 Word problems

Starting point

There is a tank measuring 12 cm by 8 cm by 14 cm.
How much water should we pour into it to fill it up?
How do we find the answer?

14 cm
8 cm
12 cm

Learning to know Solving word problems

A rectangular tank measures 12 cm by 5 cm by 7 cm. Find the capacity of the tank.

Capacity of tank = 12 × 5 × 7
= 420 cm³

The capacity of the tank is 420 cm³.

7 cm
5 cm
12 cm

A cubical container has sides of 15 cm long. It is filled with oil completely. The oil is then poured into 4 similar bottles until they are full. The capacity of each bottle is 650 cm³. How much oil is left in the container in *l*?

15 cm

Volume of oil in the container = 15 × 15 × 15
= 3,375 cm³

Total capacity of 4 bottles = 650 × 4
= 2,600 cm³

Volume of oil left in the container = 3,375 – 2,600
= 775 cm³
= 0.775 *l*

0.775 *l* of oil is left in the container.

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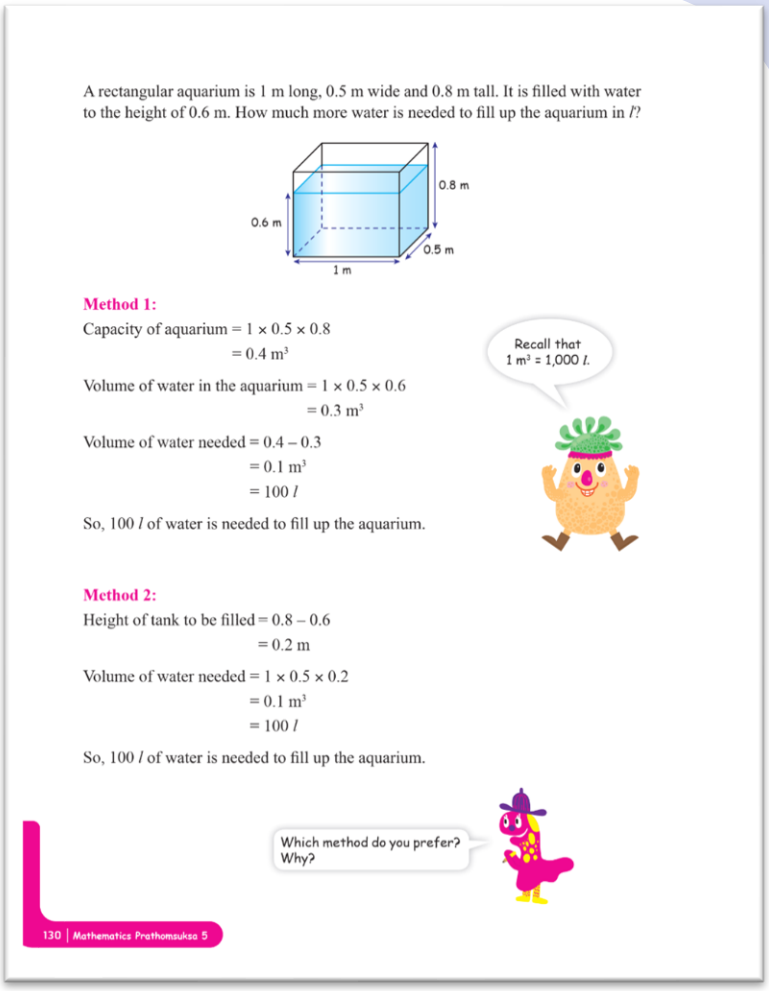
More Info

or visit
http://tiny.cc/szpsuz



A rectangular aquarium is 1 m long, 0.5 m wide and 0.8 m tall. It is filled with water to the height of 0.6 m. How much more water is needed to fill up the aquarium in *l*?

Method 1:

Capacity of aquarium = $1 \times 0.5 \times 0.8$
= $0.4\ m^3$

Volume of water in the aquarium = $1 \times 0.5 \times 0.6$
= $0.3\ m^3$

Volume of water needed = $0.4 - 0.3$
= $0.1\ m^3$
= $100\ l$

So, 100 *l* of water is needed to fill up the aquarium.

Recall that $1\ m^3 = 1{,}000\ l$.

Method 2:

Height of tank to be filled = $0.8 - 0.6$
= 0.2 m

Volume of water needed = $1 \times 0.5 \times 0.2$
= $0.1\ m^3$
= $100\ l$

So, 100 *l* of water is needed to fill up the aquarium.

Which method do you prefer? Why?

Teaching ideas

Step 2: Plan and execute

- Ask them to find the keyword in the problem that indicates the operation whether to add, to subtract, to multiply or to divide.
- Then, write the number equation and solve it.

Step 3: Check the answer

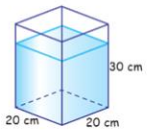
- Always ask the students to check their answer. They need to check if the answer makes sense and is reasonable.

2. Work with them the 3 steps in solving the word problems.

Teaching ideas

3. Work with them the 3 steps in solving the word problems.
4. Guide the students to refer to **Starting Point** on page 129. Ask them to answer the questions. Have a discussion to conclude the lesson.

A rectangular tank has a square base with side 20 cm. Its height is 30 cm. It is filled with water up to $\frac{3}{4}$ of its height. Then, 6.6 *l* of water from the tank is poured out. How much water is left in the tank in *l* and m*l*?

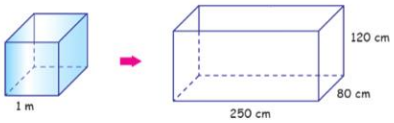


Volume of water in the tank = $\frac{3}{4} \times 20 \times 20 \times 30$
= 9,000 cm^3
= 9 *l*

Volume of water left in the tank = 9 – 6.6
= 2.4 *l*
= 2 *l* 400 m*l*

2 *l* 400 m*l* of water is left in the tank.

A cubical tank with side 1 m is filled with water. The water is then poured into a rectangular tank measuring 250 cm by 80 cm by 120 cm. How much more water is needed to fill up the rectangular tank in *l*?



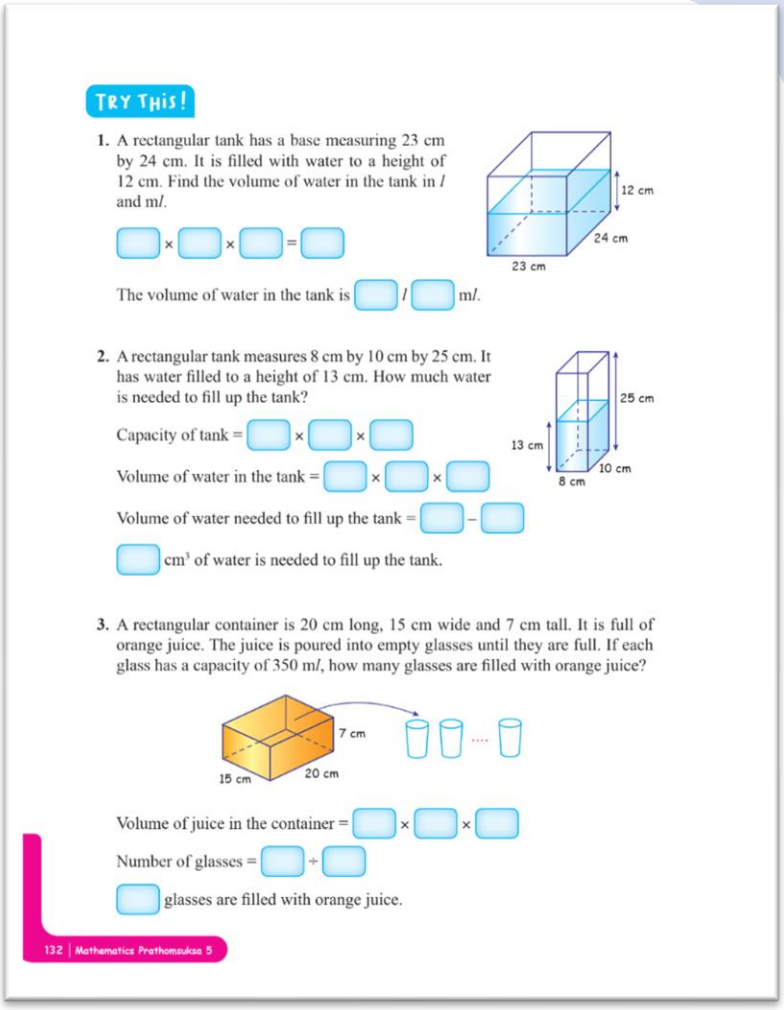
Volume of water in the cubical tank = 1 m^3
= 1,000 *l*

Capacity of rectangular tank = 250 × 80 × 120
= 2,400,000 cm^3
= 2,400 *l*

Volume of water needed to fill up the rectangular tank = 2,400 – 1,000
= 1,400 *l*

1,400 *l* of water is needed to fill up the rectangular tank.

Chapter 8 | 131



TRY THIS!

1. A rectangular tank has a base measuring 23 cm by 24 cm. It is filled with water to a height of 12 cm. Find the volume of water in the tank in *l* and m*l*.

□ × □ × □ = □

The volume of water in the tank is □ *l* □ m*l*.

2. A rectangular tank measures 8 cm by 10 cm by 25 cm. It has water filled to a height of 13 cm. How much water is needed to fill up the tank?

Capacity of tank = □ × □ × □

Volume of water in the tank = □ × □ × □

Volume of water needed to fill up the tank = □ − □

□ cm^3 of water is needed to fill up the tank.

3. A rectangular container is 20 cm long, 15 cm wide and 7 cm tall. It is full of orange juice. The juice is poured into empty glasses until they are full. If each glass has a capacity of 350 m*l*, how many glasses are filled with orange juice?

Volume of juice in the container = □ × □ × □

Number of glasses = □ ÷ □

□ glasses are filled with orange juice.

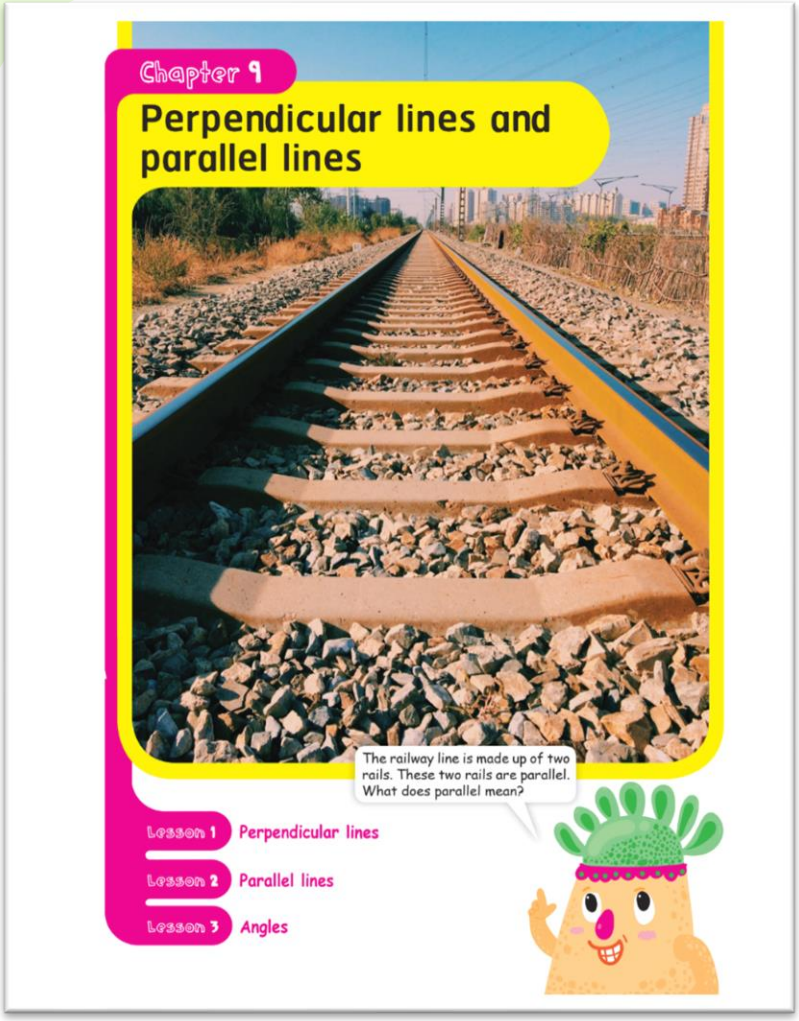
Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 123 to 127 in Go Get Maths Workbook P5.

Chapter 9
Perpendicular lines and parallel lines



The big idea

Ask the students to look at the picture carefully. Ask them these questions to start a discussion:

a) Have you taken a ride on a train or the rail transit (Skytrain or Subway)?

b) What do these vehicles run on?

c) Have you seen this track before?

d) How many rails do a track have?

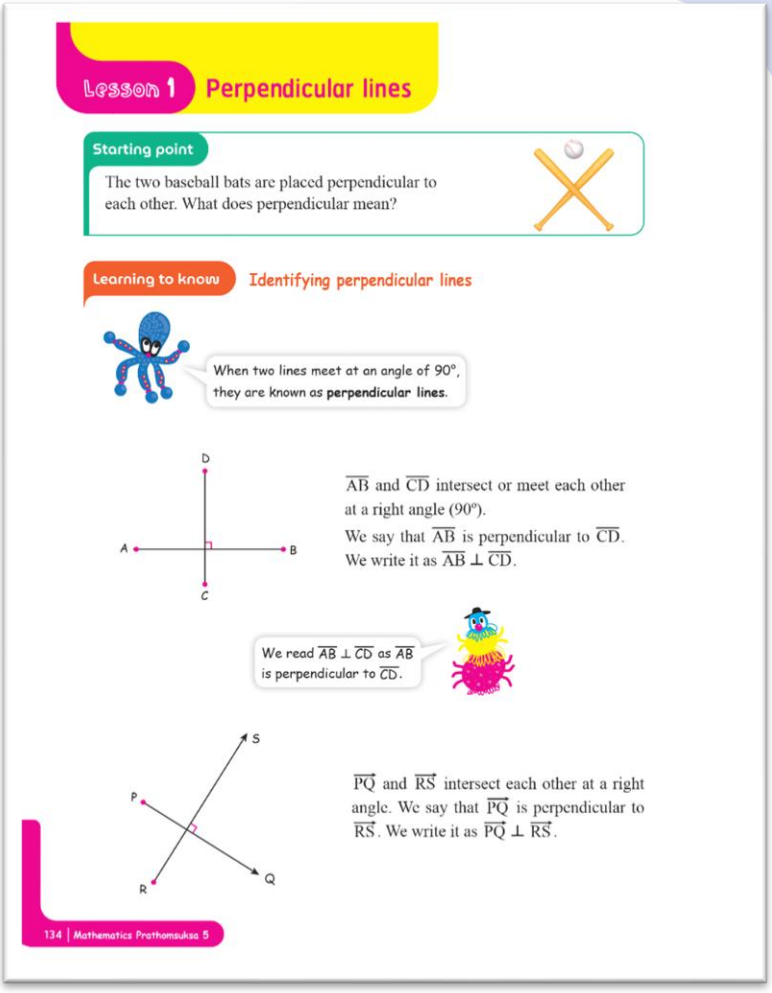
e) Do the rails of a track cross each other?

Strand 2: Measurement and geometry

Standard M.2.2

Indicators:

M 2.2 Gr5/1 Construct straight lines or line segments paralleled to the given straight lines or line segments.



Lesson 1 Perpendicular lines

Starting point

The two baseball bats are placed perpendicular to each other. What does perpendicular mean?

Learning to know Identifying perpendicular lines

When two lines meet at an angle of 90°, they are known as **perpendicular lines**.

D
A B
C

$\overline{AB}$ and $\overline{CD}$ intersect or meet each other at a right angle (90°).
We say that $\overline{AB}$ is perpendicular to $\overline{CD}$.
We write it as $\overline{AB} \perp \overline{CD}$.

We read $\overline{AB} \perp \overline{CD}$ as $\overline{AB}$ is perpendicular to $\overline{CD}$.

S
P
R Q

$\overrightarrow{PQ}$ and $\overrightarrow{RS}$ intersect each other at a right angle. We say that $\overrightarrow{PQ}$ is perpendicular to $\overrightarrow{RS}$. We write it as $\overrightarrow{PQ} \perp \overrightarrow{RS}$.

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More Info

or visit
http://tiny.cc/tzpsuz

Lesson 1 Perpendicular lines

Lesson objectives

By the end of the lesson, the students should be able to:

1. Identify perpendicular lines.
2. Construct perpendicular lines.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Perpendicular lines

Materials needed

Set square, protractor, square grid, ruler

Starting point

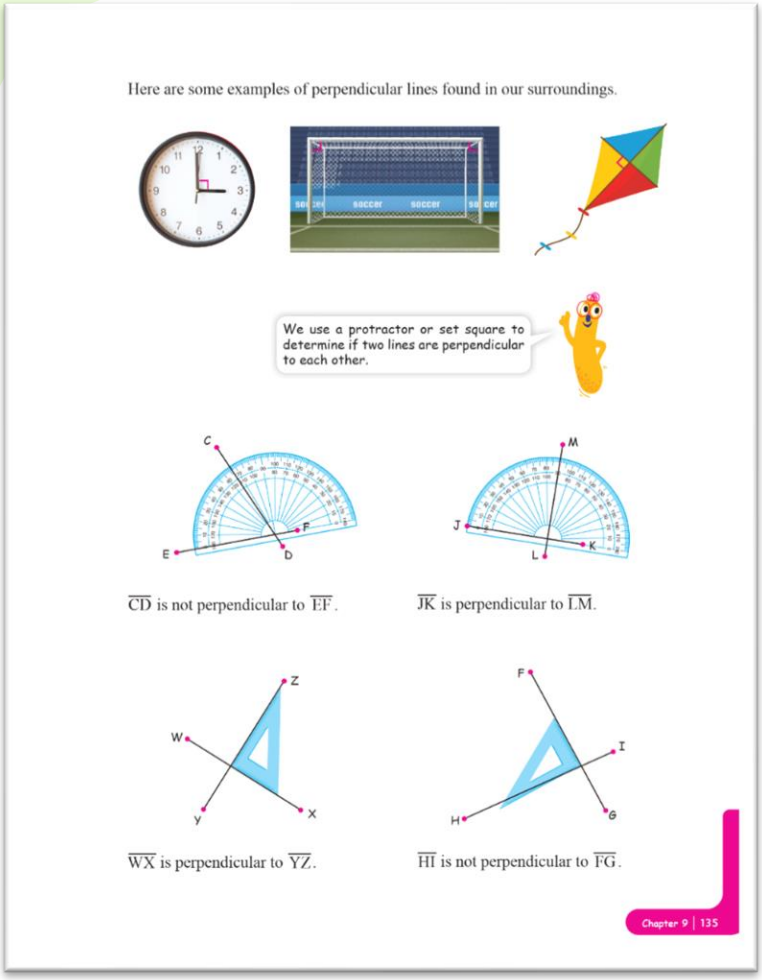
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Tell the students that two lines are perpendicular when they cross each other at a right angle or 90°.
2. Ask the students to use a protractor to measure the angles made by $\overline{AB}$ and $\overline{CD}$, and $\overline{PQ}$ and $\overline{RS}$.
3. Introduce $\perp$ as the sign to indicate the perpendicular lines.
4. Use the example to explain further.

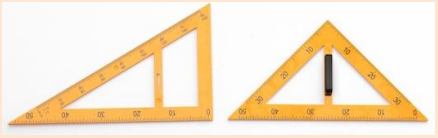
Teaching ideas

5. Show some examples of perpendicular lines that are found around us such as the 2 edges of a book and the cross.
6. To find out if 2 lines are perpendicular, ask the students to measure with a protractor. The 2 perpendicular lines must make a 90° angle.
7. Use the examples to explain.
8. Besides a protractor, tell the students that a set square can be used too.
9. Use the examples to explain.

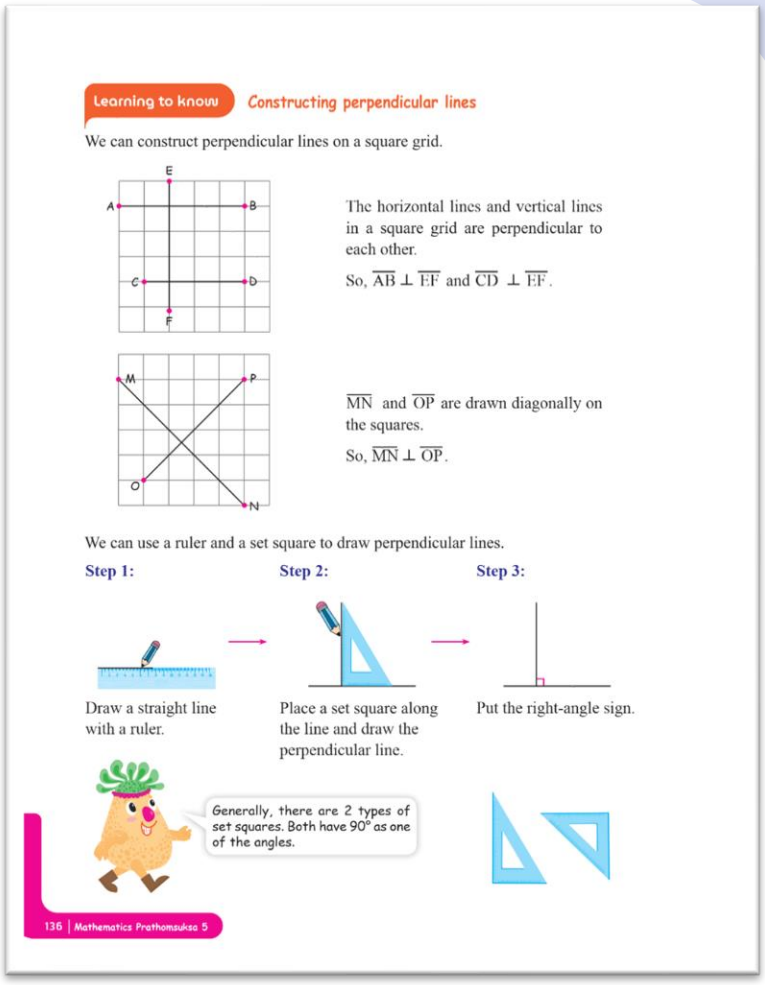


Extra notes

Set squares are found commonly in geometry box. There are two kinds of set squares available in the market.



One has an angle of 45 degrees and the other has 30-60 degrees. Both have an angle of 90 degrees. With the help of set squares, we can draw parallel lines and perpendicular lines, make some standard angles, and so on.



Learning to know Constructing perpendicular lines

We can construct perpendicular lines on a square grid.

The horizontal lines and vertical lines in a square grid are perpendicular to each other.

So, $\overline{AB} \perp \overline{EF}$ and $\overline{CD} \perp \overline{EF}$.

$\overline{MN}$ and $\overline{OP}$ are drawn diagonally on the squares.

So, $\overline{MN} \perp \overline{OP}$.

We can use a ruler and a set square to draw perpendicular lines.

Step 1: Draw a straight line with a ruler.

Step 2: Place a set square along the line and draw the perpendicular line.

Step 3: Put the right-angle sign.

Teaching ideas

1. Show the students a square grid. Ask them to measure the angles formed on it and also the length of the boxes on it. The horizontal and vertical lines on it are actually perpendicular.
2. Guide them to draw some perpendicular lines on it by drawing horizontal and vertical lines.
3. Guide them to draw lines along the diagonals of the boxes on the square grid. Those lines that are crossing each other are perpendicular too.
4. Use the examples to explain.
5. Guide them to draw perpendicular lines using a ruler and a set square.
6. Use the example to explain.

Teaching ideas

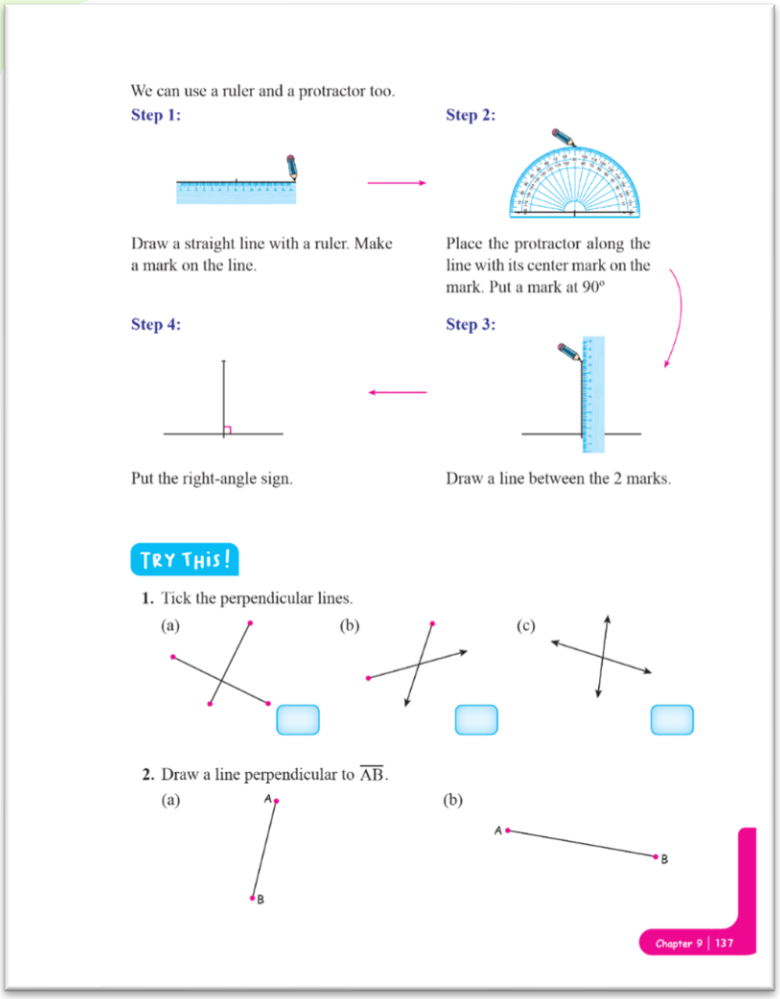
7. Guide them to draw perpendicular lines using a ruler and a protractor.
8. Use the example to explain.
9. Guide the students to refer to **Starting Point** on page 134. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 5 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 128 and 129 in Go Get Maths Workbook P5.



We can use a ruler and a protractor too.

Step 1:

Draw a straight line with a ruler. Make a mark on the line.

Step 2:

Place the protractor along the line with its center mark on the mark. Put a mark at 90°

Step 3:

Draw a line between the 2 marks.

Step 4:

Put the right-angle sign.

TRY THIS!

1. Tick the perpendicular lines.

(a) (b) (c)

2. Draw a line perpendicular to $\overline{AB}$.

(a) (b)

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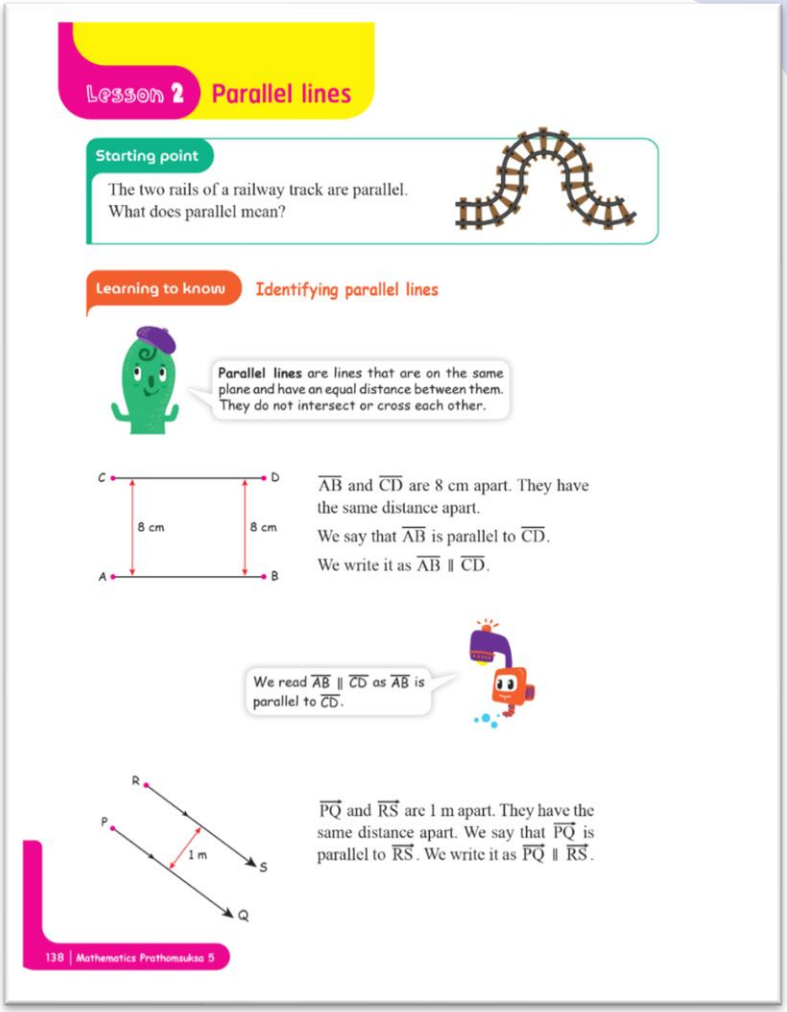

Lesson 2 Parallel lines

Starting point

The two rails of a railway track are parallel.
What does parallel mean?

Learning to know Identifying parallel lines

Parallel lines are lines that are on the same plane and have an equal distance between them. They do not intersect or cross each other.

8 cm 8 cm

$\overline{AB}$ and $\overline{CD}$ are 8 cm apart. They have the same distance apart.
We say that $\overline{AB}$ is parallel to $\overline{CD}$.
We write it as $\overline{AB} \parallel \overline{CD}$.

We read $\overline{AB} \parallel \overline{CD}$ as $\overline{AB}$ is parallel to $\overline{CD}$.

1 m

$\overrightarrow{PQ}$ and $\overrightarrow{RS}$ are 1 m apart. They have the same distance apart. We say that $\overrightarrow{PQ}$ is parallel to $\overrightarrow{RS}$. We write it as $\overrightarrow{PQ} \parallel \overrightarrow{RS}$.

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More Info

or visit
http://tiny.cc/vzpsuz

Lesson 2
Parallel lines

Lesson objectives

By the end of the lesson, the students should be able to:

1. Identify parallel lines.
2. Construct parallel lines.

Suggested teaching time

3 periods (3 x 50 minutes)

Vocabulary

Parallel lines

Materials needed

Square grid, set square, ruler

Starting point

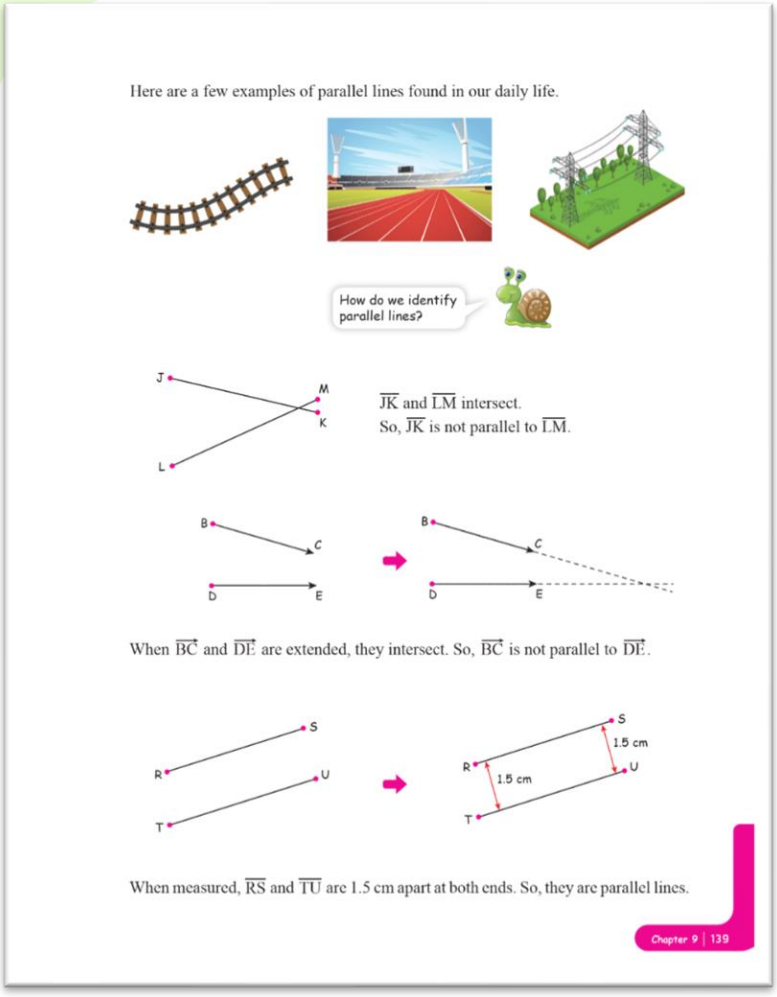
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

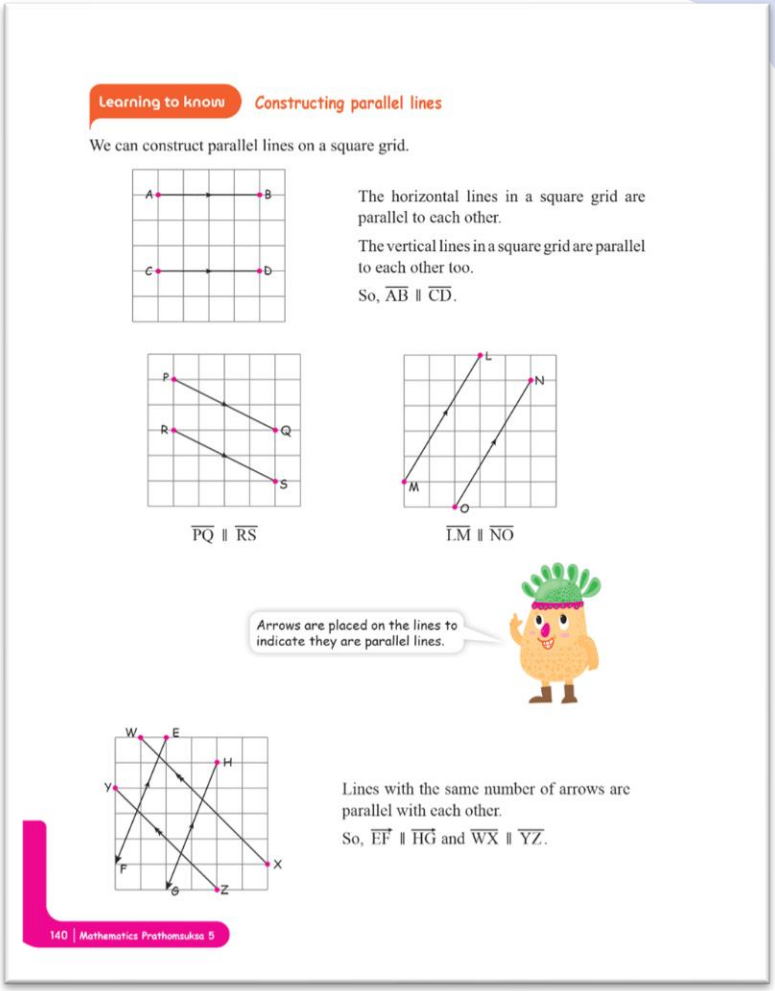
Teaching ideas

1. Tell the students that two lines are parallel when they are on the same plane and have the same distance between them.
2. Ask the students to measure the distance between $\overline{AB}$ and $\overline{CD}$, and $\overline{PQ}$ and $\overline{RS}$. They are the same.
3. Introduce $\parallel$ as the sign to indicate the parallel lines.
4. Use the example to explain further.

Teaching ideas

5. Show some examples of parallel lines that are found around us such as the 2 parallel edges of a book and the zebra crossing.
6. To identify if 2 lines are parallel, ask the students to extend the lines and if they do not meet, then they are parallel.
7. Besides that, tell the students to measure the distance between them. They should be apart with the same distance.
8. Use the examples to explain.





Teaching ideas

1. Show the students a square grid. Ask them to measure the length between the lines. The horizontal lines are parallel and so are the horizontal lines.
2. Guide them to draw some parallel lines on the square grid by drawing 2 horizontal lines or vertical lines.
3. Guide them to draw parallel lines with similar angle to the vertical or horizontal lines on the square grid.
4. Use the examples to explain.
5. Tell them that arrows are placed on the lines to indicate they are parallel.
6. Using the example, guide the students to identify the pairs of parallel lines. Tell the students that lines with similar number of arrows are parallel to each other.

Teaching ideas

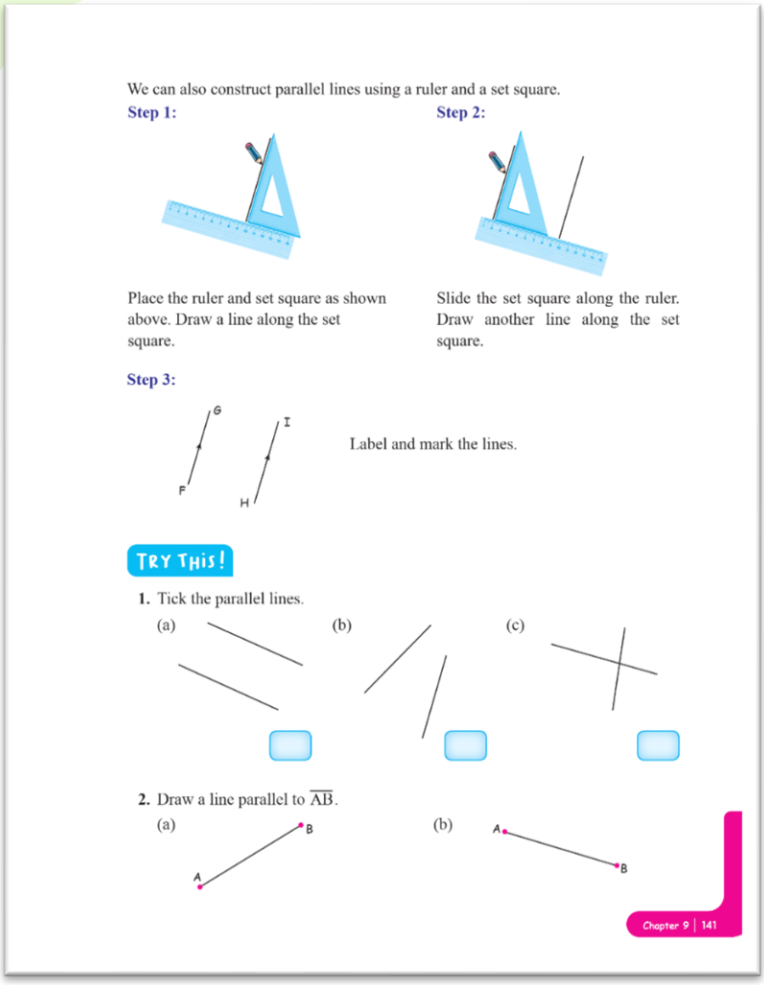
7. Guide them to draw parallel lines using a ruler and a set square.
8. Use the example to explain. Remind them to add the arrows to indicate the parallel lines.
9. Guide the students to refer to **Starting Point** on page 138. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 5 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 130 and 131 in Go Get Maths Workbook P5.



We can also construct parallel lines using a ruler and a set square.

Step 1:

Step 2:

Place the ruler and set square as shown above. Draw a line along the set square.

Slide the set square along the ruler. Draw another line along the set square.

Step 3:

Label and mark the lines.

TRY THIS!

1. Tick the parallel lines.

(a) (b) (c)

2. Draw a line parallel to $\overline{AB}$.

(a) (b)

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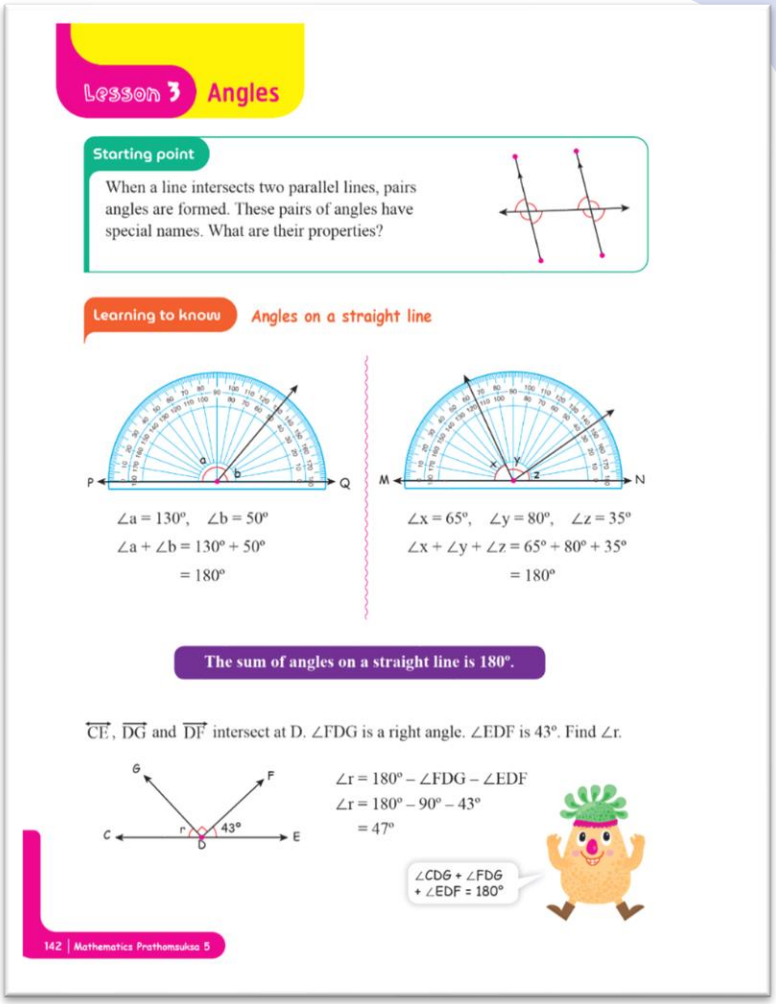

Lesson 3 Angles

Starting point

When a line intersects two parallel lines, pairs angles are formed. These pairs of angles have special names. What are their properties?

Learning to know Angles on a straight line

$\angle a = 130°, \quad \angle b = 50°$

$\angle a + \angle b = 130° + 50°$

$= 180°$

$\angle x = 65°, \quad \angle y = 80°, \quad \angle z = 35°$

$\angle x + \angle y + \angle z = 65° + 80° + 35°$

$= 180°$

The sum of angles on a straight line is 180°.

$\overleftrightarrow{CE}$, $\overleftrightarrow{DG}$ and $\overleftrightarrow{DF}$ intersect at D. $\angle FDG$ is a right angle. $\angle EDF$ is 43°. Find $\angle r$.

$\angle r = 180° - \angle FDG - \angle EDF$

$\angle r = 180° - 90° - 43°$

$= 47°$

$\angle CDG + \angle FDG + \angle EDF = 180°$

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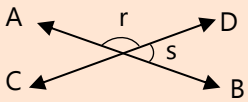
Extra notes



In the diagram above, $\angle r + \angle s = 180°$. Both angles are on $\overleftrightarrow{AB}$.

Lesson 3 Angles

Lesson objectives

By the end of the lesson, the students should be able to:

1. Realize that the sum of angles on a straight line is 180°.
2. Realize that the sum of angles at a point is 360°.
3. Realize that vertically opposite angles are similar.

Suggested teaching time

6 periods (4 x 50 minutes)

Vocabulary

Angle, vertically opposite angles, transversal, corresponding angles, consecutive interior angles, alternate interior angles, consecutive exterior angles, alternate exterior angles

Materials needed

Protractor, ruler

Starting point

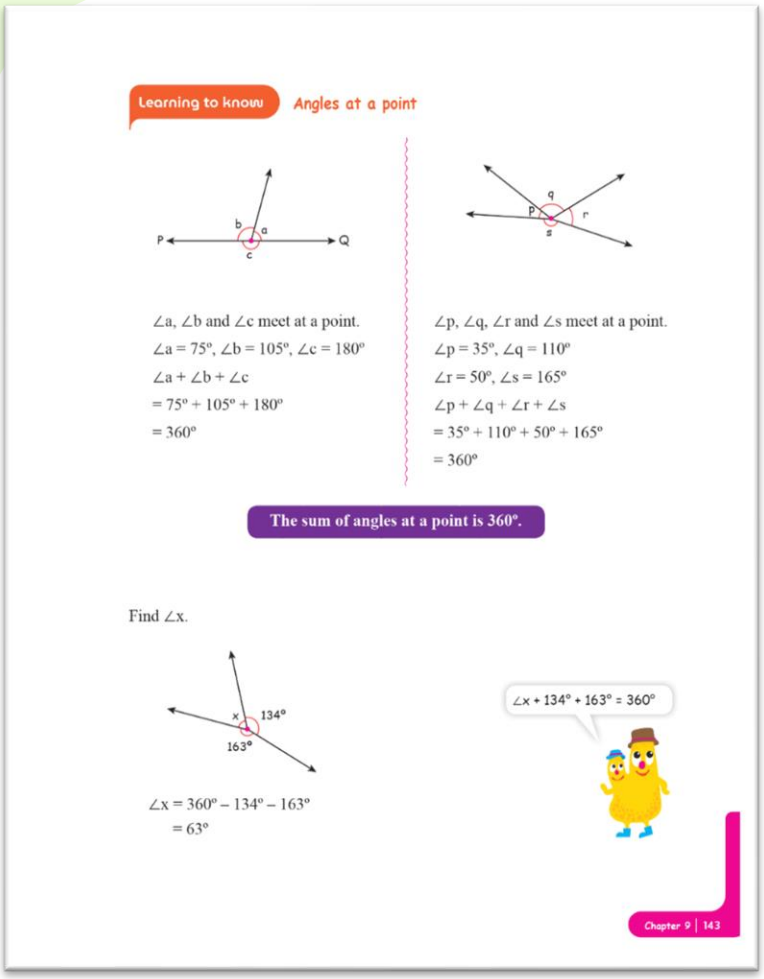
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Ask the students to draw a straight line and another straight line joining the first line. Ask them to identify the 2 angles formed.
2. Ask them to measure the angles and find the sum of the angles. Tell them that the sum of angles on a straight line is 180°.
3. Use the example to find the unknown angle on the straight line.

Teaching ideas

4. Ask the students to draw a dot and 3 straight lines coming out of the dot. Ask them to identify the 3 angles formed.
5. Ask them to measure the angles and find the sum of the angles. Tell them that the sum of angles at a point is 360°.
6. Use the example to find the unknown angle at a point.



Learning to know Angles at a point

∠a, ∠b and ∠c meet at a point.
∠a = 75°, ∠b = 105°, ∠c = 180°
∠a + ∠b + ∠c
= 75° + 105° + 180°
= 360°

∠p, ∠q, ∠r and ∠s meet at a point.
∠p = 35°, ∠q = 110°
∠r = 50°, ∠s = 165°
∠p + ∠q + ∠r + ∠s
= 35° + 110° + 50° + 165°
= 360°

The sum of angles at a point is 360°.

Find ∠x.

∠x = 360° – 134° – 163°
= 63°

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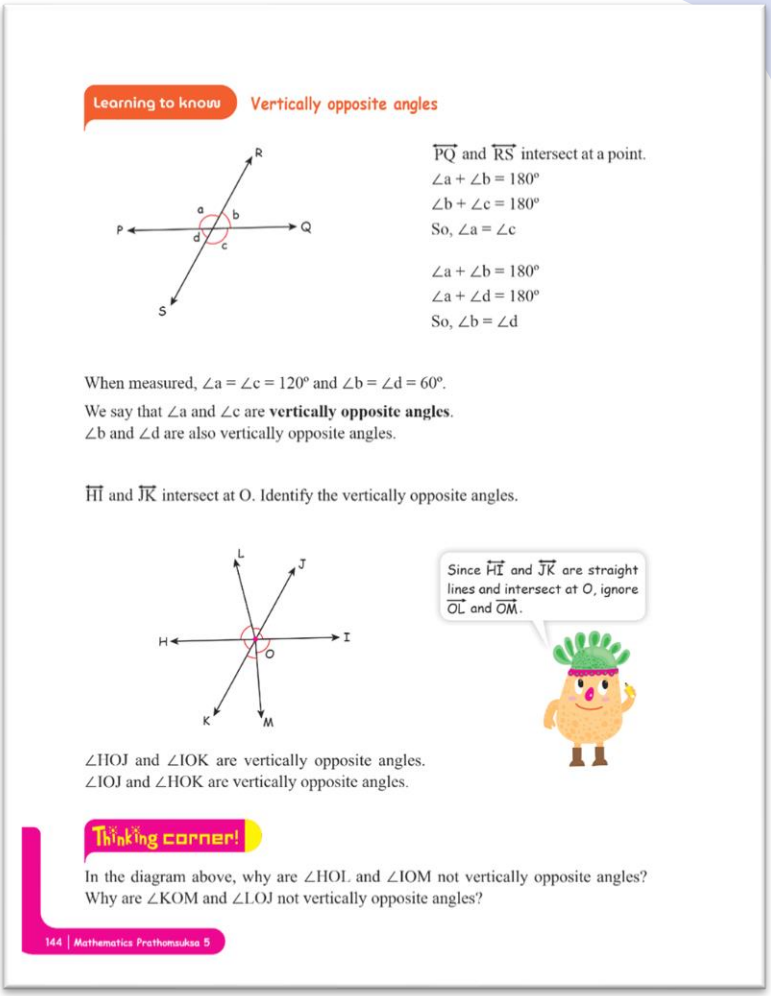

Learning to know Vertically opposite angles

$\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ intersect at a point.
$\angle a + \angle b = 180°$
$\angle b + \angle c = 180°$
So, $\angle a = \angle c$

$\angle a + \angle b = 180°$
$\angle a + \angle d = 180°$
So, $\angle b = \angle d$

When measured, $\angle a = \angle c = 120°$ and $\angle b = \angle d = 60°$.

We say that $\angle a$ and $\angle c$ are **vertically opposite angles**.
$\angle b$ and $\angle d$ are also vertically opposite angles.

$\overleftrightarrow{HI}$ and $\overleftrightarrow{JK}$ intersect at O. Identify the vertically opposite angles.

$\angle HOJ$ and $\angle IOK$ are vertically opposite angles.
$\angle IOJ$ and $\angle HOK$ are vertically opposite angles.

Thinking corner!

In the diagram above, why are $\angle HOL$ and $\angle IOM$ not vertically opposite angles? Why are $\angle KOM$ and $\angle LOJ$ not vertically opposite angles?

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Teaching ideas

1. Draw 2 straight lines that intersect each other on the board. Guide the students to identify the 4 angles formed. Guide them to identify the 2 pairs of vertically opposite angles.
2. Ask the students to draw 2 straight lines that intersect each other. Ask them to identify the 2 pairs of vertically opposite angles formed.
3. Ask them to measure each pair of vertically opposite angles. Are the angles in each vertically opposite angles the same? Tell them that the vertically opposite angles are the same.
4. Use the example to identify the pairs of vertically opposite angles. Reiterate that these angles exist when 2 straight lines intersect each other.

Thinking Corner!

Ask the students to identify the straight lines that cross each other. Only $\overleftrightarrow{HI}$ and $\overleftrightarrow{JK}$ are the straight lines that intersect each other.

Teaching ideas

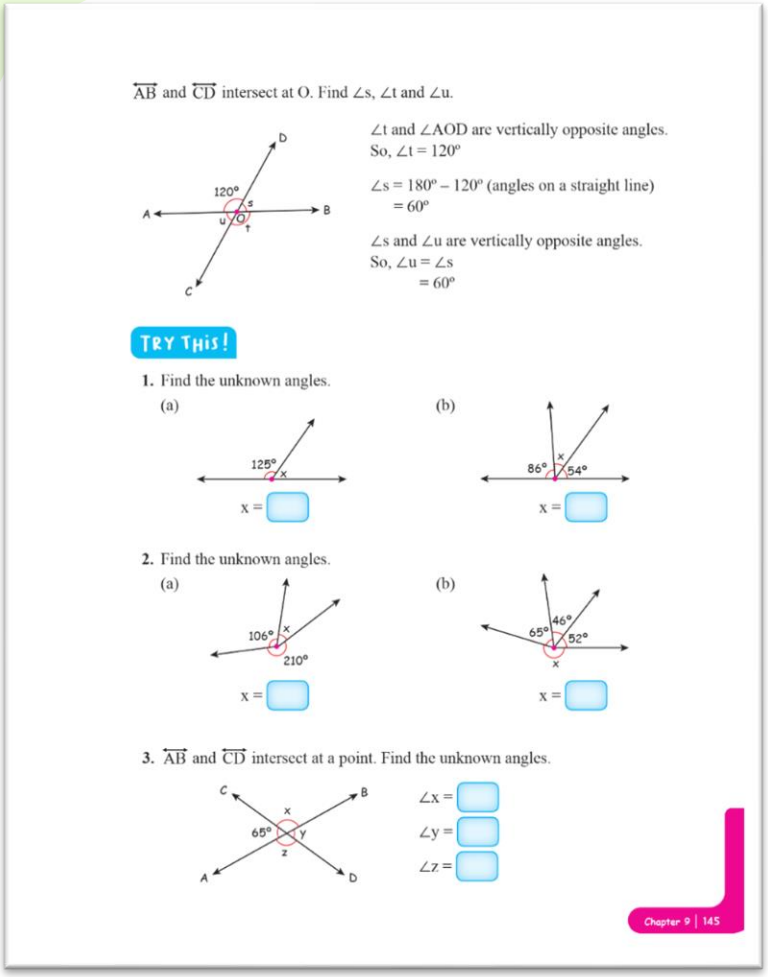
5. Referring to the diagram in the book, guide the students to identify the 2 pairs of vertically opposite angles. Guide them to find the unknown angles.

Try This!

Get 7 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 132 to 134 in Go Get Maths Workbook P5.



$\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at O. Find ∠s, ∠t and ∠u.

∠t and ∠AOD are vertically opposite angles.
So, ∠t = 120°

∠s = 180° – 120° (angles on a straight line)
= 60°

∠s and ∠u are vertically opposite angles.
So, ∠u = ∠s
= 60°

TRY THIS!

1. Find the unknown angles.

(a)

x =

(b)

x =

2. Find the unknown angles.

(a)

x =

(b)

x =

3. $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at a point. Find the unknown angles.

∠x =

∠y =

∠z =

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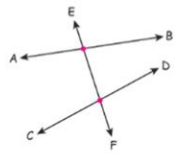
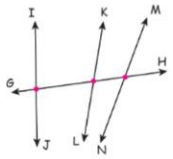
Learning to know Angles formed by parallel lines and transversals

When a line intersects two or more lines at different points, it is known as a **transversal**.

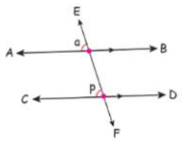


$\overleftrightarrow{EF}$ intersects $\overline{AB}$ and $\overline{CD}$.
So, $\overleftrightarrow{EF}$ is a transversal.

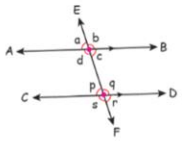


$\overleftrightarrow{GH}$ intersects $\overleftrightarrow{IJ}$, $\overleftrightarrow{KL}$ and $\overleftrightarrow{MN}$.
So, $\overleftrightarrow{GH}$ is a transversal.

When two parallel lines are intersected by a transversal, pairs of angles are formed.



∠a and ∠p are in the same relative positions and laying along the same side of the transversal.
So, ∠a and ∠p are known as **corresponding angles**.

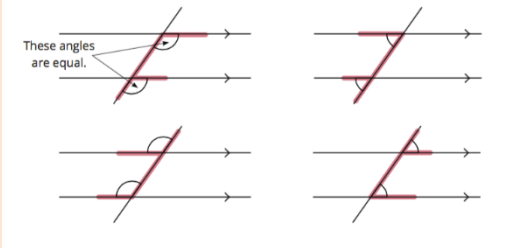


Other pairs of corresponding angles are
- ∠b and ∠q
- ∠d and ∠s
- ∠c and ∠r

Corresponding angles are **equal**.
So, ∠a = ∠p, ∠b = ∠q, ∠d = ∠s and ∠c = ∠r.

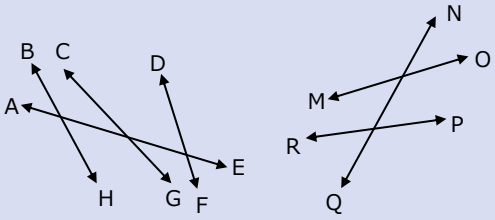
Extra notes

We can easily identify pairs of corresponding angles by looking for the **F** formation (either flipped or upside down or both).



Teaching ideas

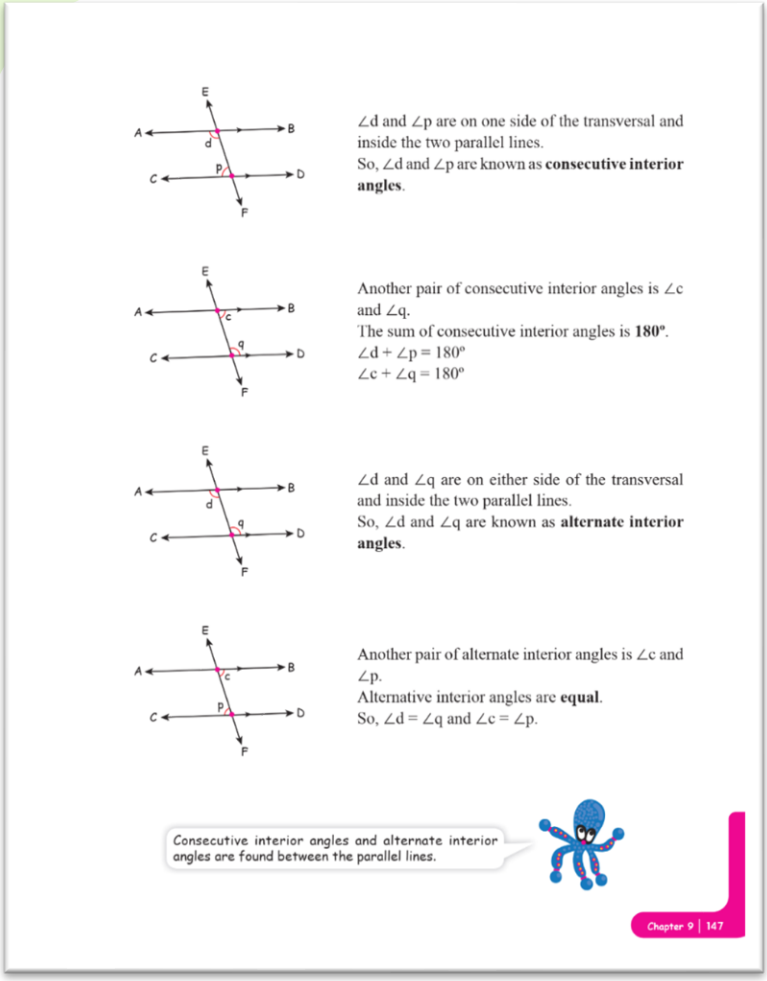
1. Introduce *transversal* as a line that intersects two or more lines at different points.
2. Draw the diagrams below on the board for the students to identify the transversals. ($\overleftrightarrow{AE}$ and $\overleftrightarrow{NQ}$ are the transversals.)



3. Draw a transversal that intersect 2 parallel lines on the board. Guide them to identify the 4 pairs of corresponding angles.
4. Tell them that the corresponding angles are on the same side of the transversal and in the matching corners, and they are equal.
5. Use the example to explain further.

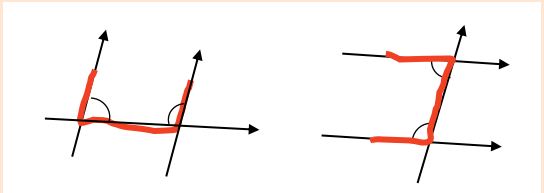
Teaching ideas

6. Draw a transversal that intersect 2 parallel lines on the board. Guide them to identify the 2 pairs of consecutive interior angles.
7. Tell them that the consecutive interior angles are on one side of the transversal and on the inner side of each of the two parallel lines, and their sum is 180°.
8. Use the example to explain further.
9. Draw a transversal that intersect 2 parallel lines on the board. Guide them to identify the 2 pairs of alternate interior angles.
10. Tell them that the alternate interior angles are on the inner side of each of those two parallel lines but on the opposite sides of the transversal. They are equal.
11. Use the example to explain further.



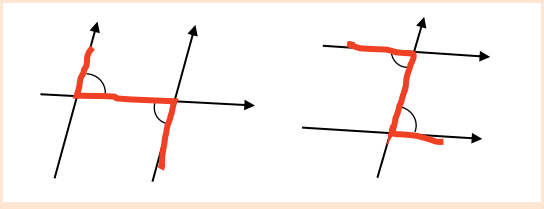
Extra notes

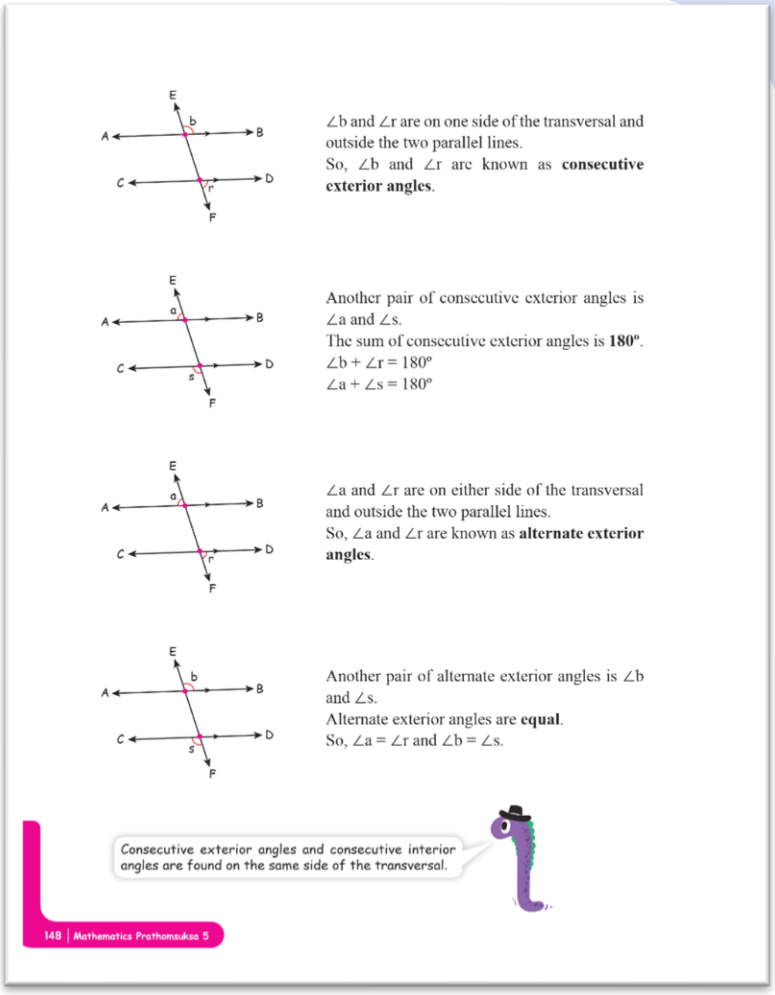
We can easily identify pairs of consecutive interior angles by looking for the **C** formation (either flipped or upside down or both).



Extra notes

We can easily identify pairs of alternate interior angles by looking for the **Z** formation (either flipped or upside down or both).





or visit
http://tiny.cc/yzpsuz

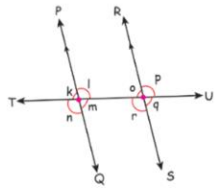
Teaching ideas

12. Draw a transversal that intersect 2 parallel lines on the board. Guide them to identify the 2 pairs of consecutive exterior angles.
13. Tell them that the consecutive exterior angles are on one side of the transversal and on the outer side of each of the two parallel lines, and their sum is 180°.
14. Use the example to explain further.
15. Draw a transversal that intersect 2 parallel lines on the board. Guide them to identify the 2 pairs of alternate exterior angles.
16. Tell them that the alternate exterior angles are on the outer side of each of those two parallel lines but on the opposite sides of the transversal. They are equal.
17. Use the example to explain further.

Teaching ideas

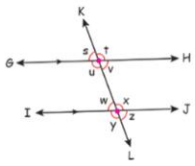
18. Draw a transversal that intersect 2 parallel lines on the board. Guide them to identify the pairs of
    - corresponding angles
    - consecutive interior angles
    - alternate interior angles
    - consecutive exterior angles
    - alternate exterior angles
19. Ask them which angles are similar and which 2 angles add up to 180°. Ask them for their reasons too.
20. Use the example to explain further.

$\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ are parallel lines. State these pairs of angles.



Corresponding angles: ∠k and ∠o, ∠l and ∠p, ∠n and ∠r, and ∠m and ∠q
Alternate interior angles: ∠m and ∠o and ∠l and ∠r
Alternate exterior angles: ∠k and ∠q and ∠n and ∠p
Consecutive interior angles: ∠l and ∠o and ∠m and ∠r
Consecutive exterior angles: ∠k and ∠p and ∠n and ∠q

$\overleftrightarrow{KL}$ intersects two parallel lines, $\overleftrightarrow{GH}$ and $\overleftrightarrow{IJ}$. State if these statements are correct and give your reasons.



Statement	✓ or ✗	Reason
∠s = ∠w	✓	They are corresponding angles.
∠t + ∠z = 180°	✓	They are consecutive exterior angles.
∠u = ∠w	✗	They are consecutive interior angles.
∠y = ∠t	✓	They are alternate exterior angles.
∠z + ∠v = 180°	✗	They are corresponding angles.
∠u + ∠x = 180°	✗	They are alternate interior angles.

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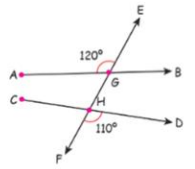
Two lines are parallel if
- the corresponding angles are equal,
- the alternate interior angles or alternate exterior angles are the same,
- the sum of consecutive interior angles or consecutive exterior angles is 180°.

Determine if $\overrightarrow{AB}$ and $\overrightarrow{CD}$ are parallel.

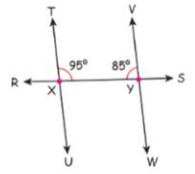


If $\overrightarrow{AB}$ and $\overrightarrow{CD}$ are parallel, ∠AGE and ∠DHF should be equal because they are alternate exterior angles.

However, ∠AGE ≠ ∠DHF.

So, $\overrightarrow{AB}$ and $\overrightarrow{CD}$ are not parallel.

Determine if $\overleftrightarrow{TU}$ and $\overleftrightarrow{VW}$ are parallel.

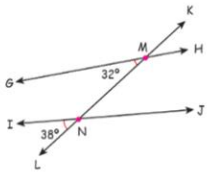


If $\overleftrightarrow{TU}$ and $\overleftrightarrow{VW}$ are parallel, the sum of ∠TXS and ∠RYV should be 180° because they are consecutive interior angles.

∠TXS + ∠RYV = 180°

So, $\overleftrightarrow{TU}$ and $\overleftrightarrow{VW}$ are parallel.

Determine if $\overleftrightarrow{GH}$ and $\overleftrightarrow{IJ}$ are parallel.



If $\overleftrightarrow{GH}$ and $\overleftrightarrow{IJ}$ are parallel, ∠GML and ∠INL should be equal because they are corresponding angles.

However, ∠GML ≠ ∠INL.

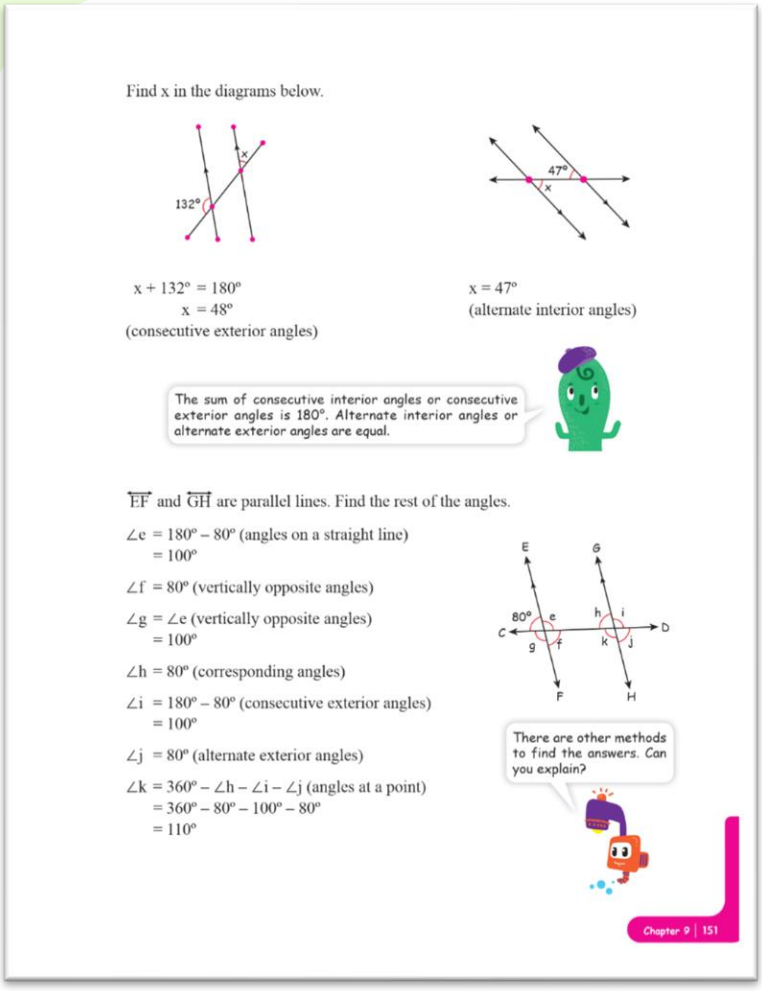
So, $\overleftrightarrow{GH}$ and $\overleftrightarrow{IJ}$ are not parallel.

Teaching ideas

21. Tell the students that they can determine if 2 lines are parallel by finding out if
    - the corresponding angles are equal,
    - the consecutive interior angles add up to give 180°,
    - the alternate interior angles are equal,
    - the consecutive exterior angles add up to give 180°,
    - the alternate exterior angles are equal.
22. Use the examples to explain further.

Teaching ideas

23. Tell the students that they can determine the unknown angles using these facts:
    - the corresponding angles are equal,
    - the consecutive interior angles add up to give 180°,
    - the alternate interior angles are equal,
    - the consecutive exterior angles add up to give 180°,
    - the alternate exterior angles are equal.
24. Use the examples to explain further.
25. Ask the students to always identify the parallel lines and the transversal first before identify the pairs of angles.
26. Guide the students to refer to **Starting Point** on page 142. Ask them to answer the question. Have a discussion to conclude the lesson.



Find x in the diagrams below.

$x + 132° = 180°$
$x = 48°$
(consecutive exterior angles)

$x = 47°$
(alternate interior angles)

$\overleftrightarrow{EF}$ and $\overleftrightarrow{GH}$ are parallel lines. Find the rest of the angles.

$\angle e = 180° - 80°$ (angles on a straight line)
$= 100°$

$\angle f = 80°$ (vertically opposite angles)

$\angle g = \angle e$ (vertically opposite angles)
$= 100°$

$\angle h = 80°$ (corresponding angles)

$\angle i = 180° - 80°$ (consecutive exterior angles)
$= 100°$

$\angle j = 80°$ (alternate exterior angles)

$\angle k = 360° - \angle h - \angle i - \angle j$ (angles at a point)
$= 360° - 80° - 100° - 80°$
$= 110°$

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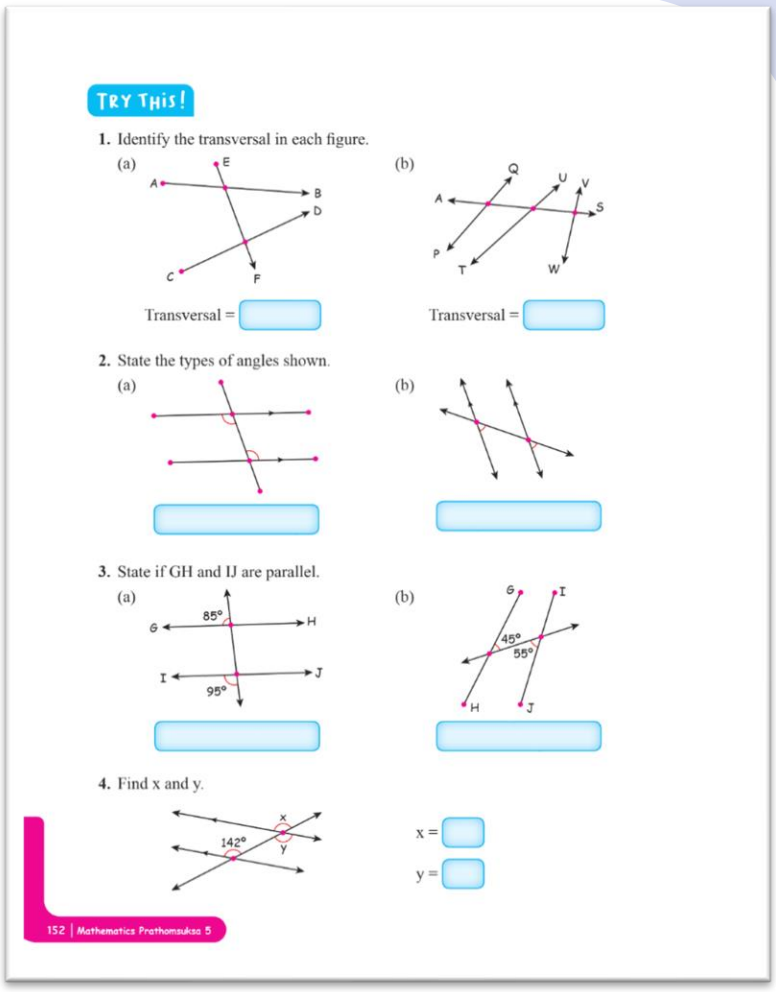


TRY THIS!

1. Identify the transversal in each figure.

(a)

Transversal =

(b)

Transversal =

2. State the types of angles shown.

(a)

(b)

3. State if GH and IJ are parallel.

(a)

(b)

4. Find x and y.

x =

y =

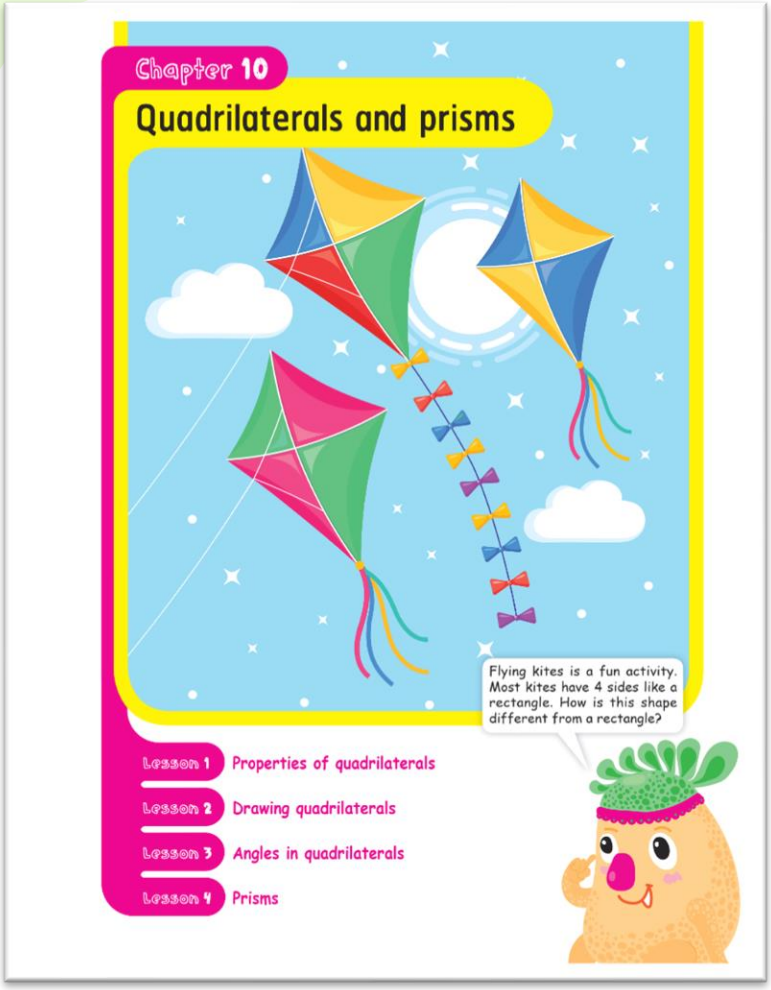
Try This!

Get 8 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 135 to 141 in Go Get Maths Workbook P5.

Chapter 10
Quadrilaterals and prisms



The big idea

1. Ask them these questions to start a discussion:
   - Do you still remember what quadrilaterals are?
   - Can you name a few properties of quadrilaterals?
   - Name a few objects that have the shapes of quadrilaterals.
2. Ask the students to look at the picture carefully. Ask them these questions to start a discussion:
   - Have you played kites before?
   - How many sides does a kite have?
   - What is the shape of your kite?

Strand 2: Measurement and geometry

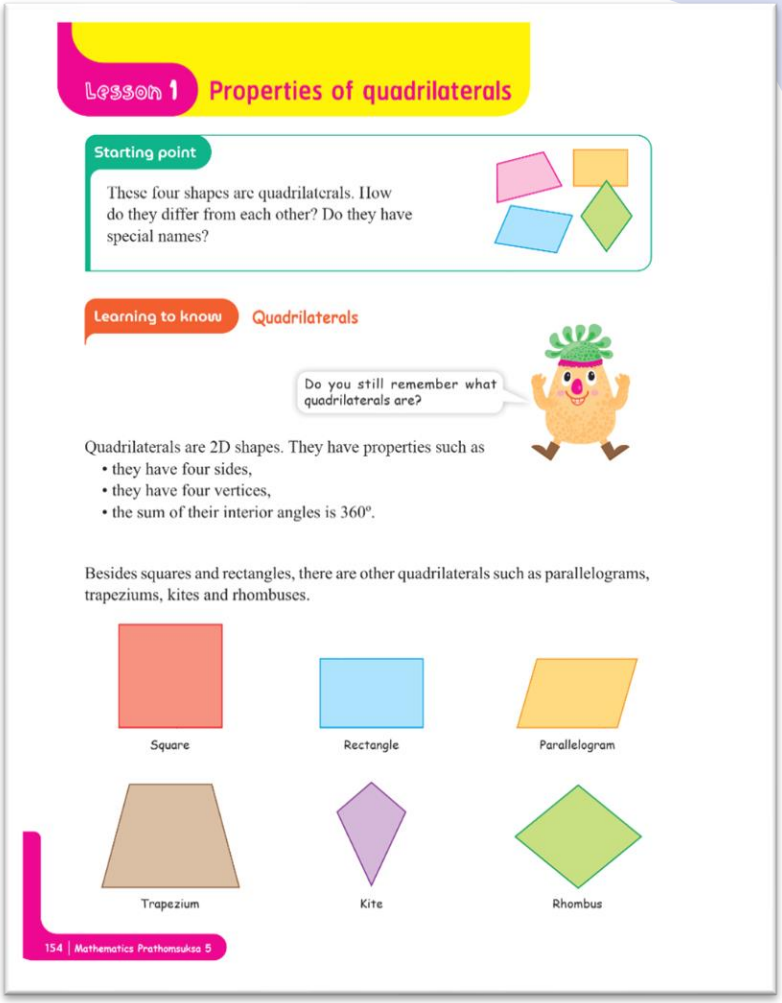
Standard M.2.2

Indicators:

M 2.2 Gr5/2 Classify quadrilaterals based on properties.

M 2.2 Gr5/3 Construct different types of quadrilaterals using given length of sides and angles or given length of diagonals.

M 2.2 Gr5/4 Tell the characteristics of the prism.



Lesson 1 Properties of quadrilaterals

Starting point

These four shapes are quadrilaterals. How do they differ from each other? Do they have special names?

Learning to know Quadrilaterals

Do you still remember what quadrilaterals are?

Quadrilaterals are 2D shapes. They have properties such as
- they have four sides,
- they have four vertices,
- the sum of their interior angles is 360°.

Besides squares and rectangles, there are other quadrilaterals such as parallelograms, trapeziums, kites and rhombuses.

Square Rectangle Parallelogram

Trapezium Kite Rhombus

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Activity for Reinforcement

Introduce some more examples to reinforce the students' ability to recognize the types of quadrilaterals.

1. Get the students in groups of three.
2. Ask them to draw and cut out the 6 types of quadrilaterals.
3. Ask the first student to show one of the cut-outs to the second student. The second student has to name the cut-out and the third student has to verify if the answer is correct. Repeat with the rest of the cards.
4. Ask them to change their roles.

Lesson 1
Properties of quadrilaterals

Lesson objectives

By the end of the lesson, the students should be able to:

1. Identify the properties of quadrilaterals.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

Quadrilateral, square, rectangle, parallelogram, trapezium, kite, rhombus, diagonal

Materials needed

Paper or cardboard, square grids, cut-outs of parallelograms, cut-outs of trapeziums

Starting point

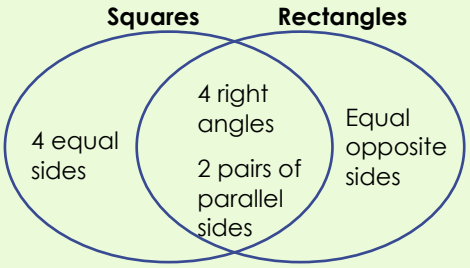
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

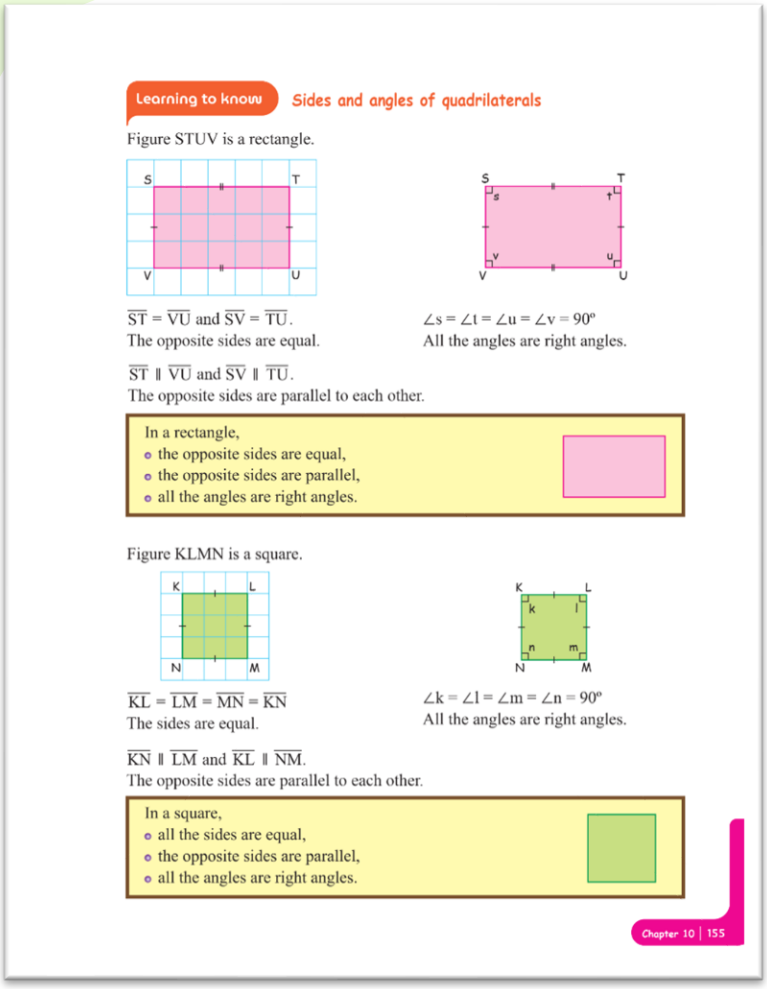
1. Ask the students to list the general properties of quadrilaterals.
2. Ask them to give examples of things that have shapes of quadrilaterals. Doors, playing cards and kites are some examples.
3. Introduce the 6 common types of quadrilaterals to the students. They are squares, rectangles, parallelograms, trapeziums, kites and rhombuses.

Teaching ideas

1. Draw a rectangle on the board.
2. Guide the students to realize that the opposite sides of a rectangle are equal and are parallel to each other.
3. Guide them to realize that the angles in a rectangle are right angles (90°).
4. Draw a square on the board.
5. Guide the students to realize that all the sides of a square are equal and the opposite sides are parallel to each other.
6. Guide them to realize that the angles in a square are right angles (90°).
7. Ask them to compare and contrast a rectangle and a square – how are they similar and how are they different?



8. Ask them to draw a rectangle and a square on a square grid. Ask them to use the squares on the square grid to help them to draw.



Learning to know Sides and angles of quadrilaterals

Figure STUV is a rectangle.

$\overline{ST} = \overline{VU}$ and $\overline{SV} = \overline{TU}$.
The opposite sides are equal.

$\angle s = \angle t = \angle u = \angle v = 90°$
All the angles are right angles.

$\overline{ST} \parallel \overline{VU}$ and $\overline{SV} \parallel \overline{TU}$.
The opposite sides are parallel to each other.

In a rectangle,
- the opposite sides are equal,
- the opposite sides are parallel,
- all the angles are right angles.

Figure KLMN is a square.

$\overline{KL} = \overline{LM} = \overline{MN} = \overline{KN}$
The sides are equal.

$\angle k = \angle l = \angle m = \angle n = 90°$
All the angles are right angles.

$\overline{KN} \parallel \overline{LM}$ and $\overline{KL} \parallel \overline{NM}$.
The opposite sides are parallel to each other.

In a square,
- all the sides are equal,
- the opposite sides are parallel,
- all the angles are right angles.

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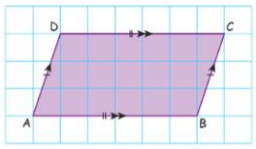
More Info
or visit
http://tiny.cc/10qsuz

Figure ABCD is a parallelogram.



$\overline{AB} = \overline{DC}$ and $\overline{AD} = \overline{BC}$.

The opposite sides are equal.

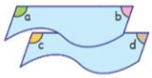
$\overline{AD} \parallel \overline{BC}$ and $\overline{DC} \parallel \overline{AB}$.

The opposite sides are parallel to each other.

Fun with Maths!

1. Work in groups of 4.
2. Get a parallelogram cut-out from your teacher.
3. Mark the angles as shown below and cut it into two pieces.

4. Turn one piece and match it with the other piece.



5. What can you say about the opposite angles of a parallelogram?

Teaching ideas

9. Draw a parallelogram on the board.
10. Guide the students to realize that
    - the angles are not 90°
    - the opposite sides are parallel
    - the opposite sides are equal
11. Ask them to draw a parallelogram on a square grid. Ask them to use the squares on the square grid to help them to draw.

Fun with Maths!

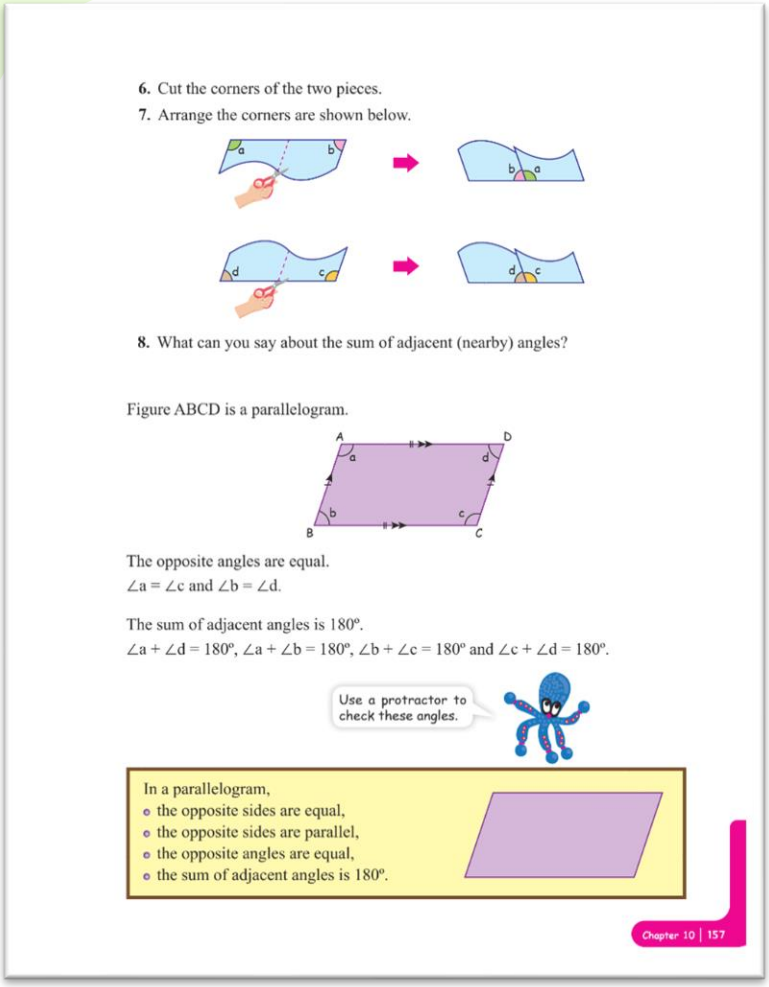
Materials required: Parallelogram cut-outs

Objective of the activity: Realizing the opposite angles of a parallelogram are equal and the sum of adjacent angles of a parallelogram is 180°

After doing this activity, the students will be able to remember the properties of the angles of a parallelogram better.

Teaching ideas

12. Draw a parallelogram on the board. Help the students to identity which pairs of angles are opposite angles and which pairs are adjacent angles.
13. Guide the students to realize that
    - the opposite angles are equal
    - the adjacent angles add up to give 180°.
14. Ask them to draw a parallelogram on a square grid. Ask them to use the squares on the square grid to help them to draw. Ask them to measure the angles to verify if the opposite angles are equal and sum of adjacent angles is 180°.



6. Cut the corners of the two pieces.
7. Arrange the corners are shown below.

8. What can you say about the sum of adjacent (nearby) angles?

Figure ABCD is a parallelogram.

The opposite angles are equal.
$\angle a = \angle c$ and $\angle b = \angle d$.

The sum of adjacent angles is 180°.
$\angle a + \angle d = 180°$, $\angle a + \angle b = 180°$, $\angle b + \angle c = 180°$ and $\angle c + \angle d = 180°$.

Use a protractor to check these angles.

In a parallelogram,
- the opposite sides are equal,
- the opposite sides are parallel,
- the opposite angles are equal,
- the sum of adjacent angles is 180°.

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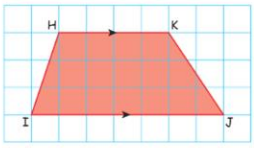
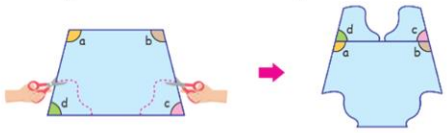
Figure HIJK is a trapezium.



$\overline{HK} \parallel \overline{IJ}$
Only one pair of opposite sides is parallel.

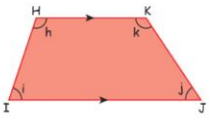
Fun with Maths!

1. Work in groups of 4.
2. Get a trapezium cut-out from your teacher.
3. Mark the angles as shown and cut it into three pieces as shown.



4. Match them as shown.
5. What can you say about the sum of adjacent angles on non-parallel sides?

Figure HIJK is trapezium.



The sum of adjacent angles on non-parallel sides is 180°.
$\angle h + \angle i = 180°$ and $\angle k + \angle j = 180°$.

In a trapezium,
- only one pair of opposite sides is parallel,
- the sum of adjacent angles on non-parallel sides is 180°.

Teaching ideas

15. Draw a trapezium on the board.
16. Guide the students to realize that there is only a pair of parallel sides.

Fun with Maths!

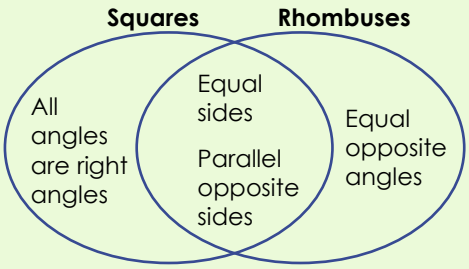
Materials required: Trapezium cut-outs
Objective of the activity: Realizing the sum of adjacent angles on non-parallel sides of a parallelogram is 180°.
After doing this activity, the students will be able to remember the properties of the angles of a trapezium better.

Teaching ideas

17. Draw a trapezium on the board.
18. Guide the students to realize that the sum of adjacent angles on non-parallel sides of a parallelogram is 180°.
19. Ask them to draw a trapezium on a square grid. Ask them to use the squares on the square grid to help them to draw. Ask them to measure the angles to verify if the sum of adjacent angles on non-parallel sides of a parallelogram is 180°.

Teaching ideas

20. Draw a rhombus on the board.
21. Guide the students to realize that
    - all angles are not 90°,
    - the opposite sides are parallel,
    - all the sides are equal,
    - the opposite angles are equal,
    - the sum of adjacent angles is 180°.
22. Ask them to compare and contrast a rhombus and a square – how are they similar and how are they different?



23. Ask them to draw a rhombus on a square grid. Ask them to use the squares on the square grid to help them to draw.

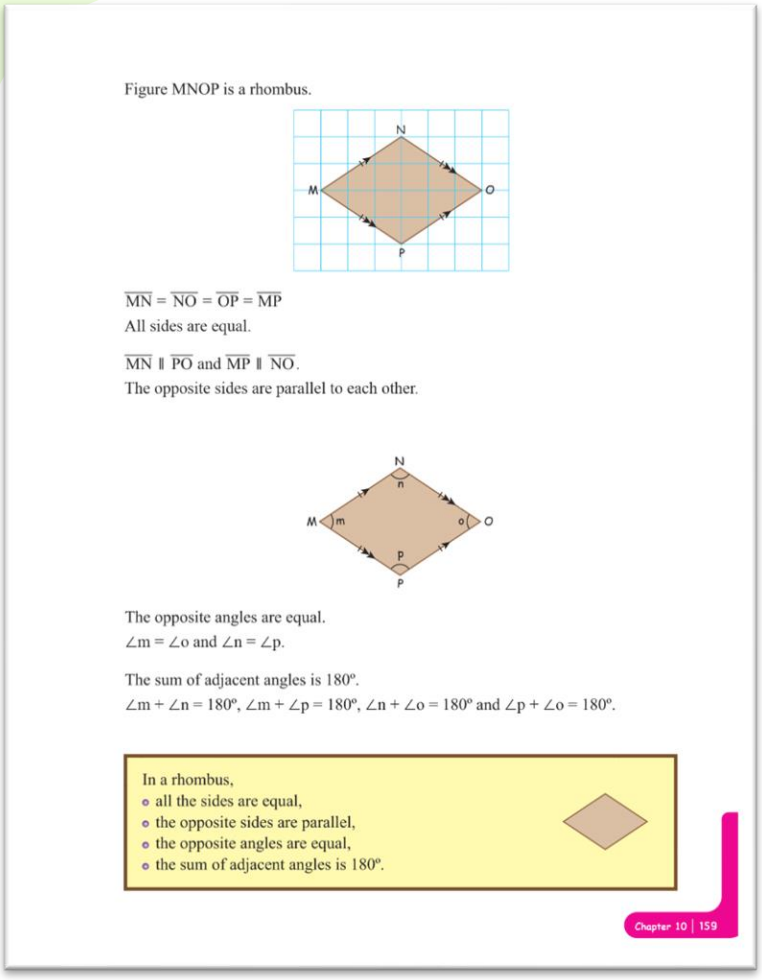


Figure MNOP is a rhombus.

$\overline{MN} = \overline{NO} = \overline{OP} = \overline{MP}$
All sides are equal.

$\overline{MN} \parallel \overline{PO}$ and $\overline{MP} \parallel \overline{NO}$.
The opposite sides are parallel to each other.

The opposite angles are equal.
$\angle m = \angle o$ and $\angle n = \angle p$.

The sum of adjacent angles is 180°.
$\angle m + \angle n = 180°$, $\angle m + \angle p = 180°$, $\angle n + \angle o = 180°$ and $\angle p + \angle o = 180°$.

In a rhombus,
- all the sides are equal,
- the opposite sides are parallel,
- the opposite angles are equal,
- the sum of adjacent angles is 180°.

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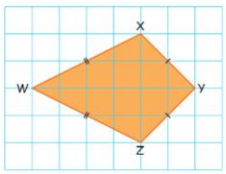
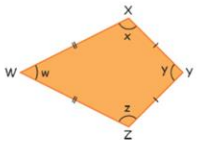
Figure WXYZ is a kite.





$\overline{WX} = \overline{WZ}$ and $\overline{XY} = \overline{YZ}$
The two pairs of adjacent sides are equal.

A pair of opposite angles is equal.
$\angle x = \angle z$

In a kite,
- two pairs of adjacent sides are equal,
- a pair of opposite angles is equal.

Learning to know Diagonals of quadrilaterals

A **diagonal** is a line segment that joints two vertices of a shape.

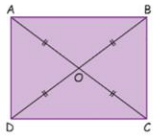


Figure ABCD is a rectangle.
$\overline{AC}$ and $\overline{BD}$ are diagonals that intersect at O.
They are equal and divide each other into halves.
$\overline{AC} = \overline{BD}$ and $\overline{AO} = \overline{BO} = \overline{CO} = \overline{DO}$.

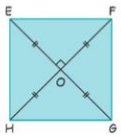


Figure EFGH is a square.
$\overline{EG}$ and $\overline{FH}$ are diagonals that intersect at O.
They are equal and divide each other into halves.
The intersection of the diagonals makes right angles.
$\overline{EG} = \overline{FH}$ and $\overline{EO} = \overline{GO} = \overline{FO} = \overline{HO}$.

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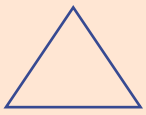
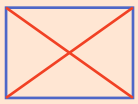
Extra notes

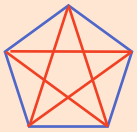
The number of diagonals in a polygon is given as $\frac{n(n-3)}{2}$ whereby n is the number of its sides.



A triangle has 3 sides.
$\frac{3(3-3)}{2} = \frac{3(0)}{2} = 0$
It has no diagonals.

A quadrilateral has 4 sides.
$\frac{4(4-3)}{2} = \frac{4(1)}{2} = 2$
It has 2 diagonals.





A pentagon has 5 sides.
$\frac{5(5-3)}{2} = \frac{5(2)}{2} = 5$
It has 5 diagonals.

Teaching ideas

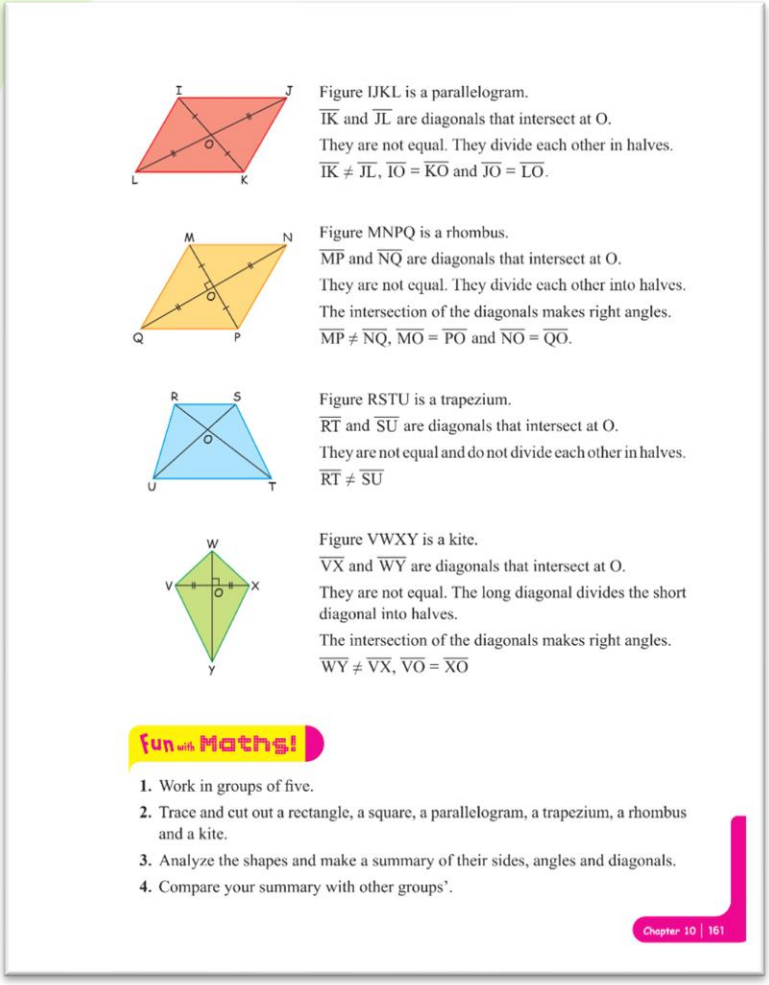
24. Draw a kite on the board.
25. Guide the students to realize that
    - all angles are not 90°,
    - the 2 pairs of adjacent sides are equal,
    - only 1 pair of opposite angles is equal.
26. Ask them to draw a kite on a square grid. Ask them to use the squares on the square grid to help them to draw.

Teaching ideas

1. Tell the students that a diagonal is a line segment that joins one vertex of a polygon to another but is not a side. In other words, it joins any two non-adjacent vertices of a polygon.
2. Draw a few polygons on the board and ask a few students to draw their diagonals. Ask them if there are any diagonals in a triangle.
3. Draw a rectangle on the board with its diagonals. Guide them to realize that the diagonals of a rectangle
    - are equal,
    - divide each other into halves,
    - their intersection does not make right angles.
4. Draw a square on the board with its diagonals. Guide them to realize that the diagonals of a square
    - are equal,
    - divide each other into halves,
    - their intersection makes right angles.

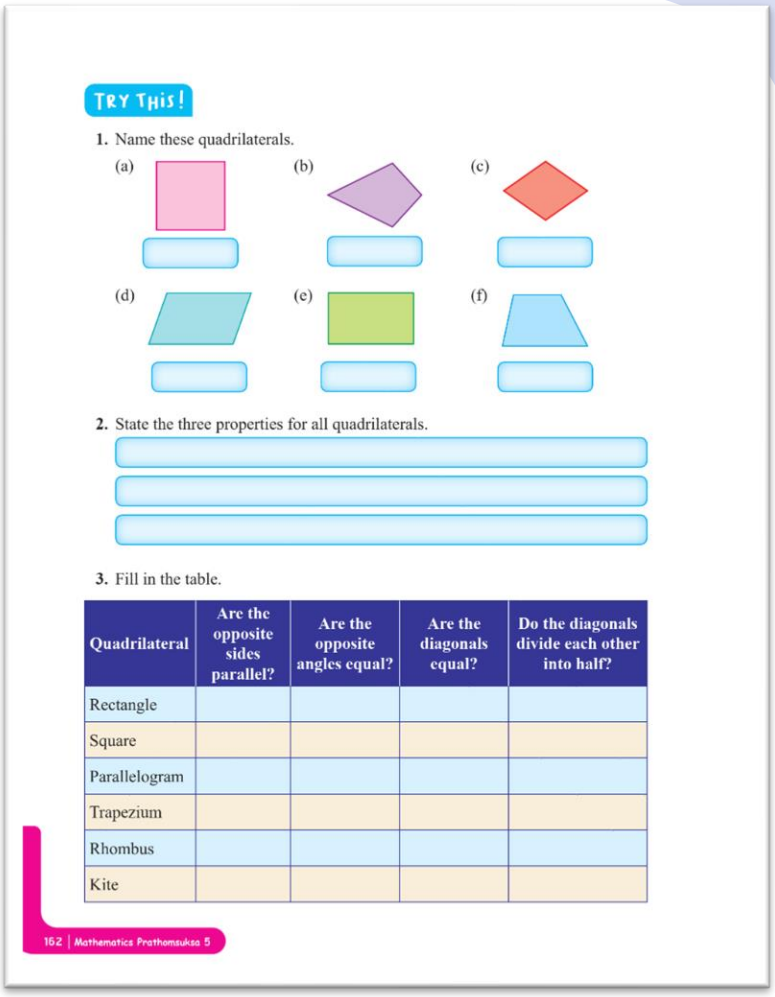
Teaching ideas

5. Draw a parallelogram on the board with its diagonals. Guide them to realize that the diagonals of a parallelogram
   - are not equal,
   - divide each other into halves,
   - their intersection does not make right angles.
6. Draw a rhombus on the board with its diagonals. Guide them to realize that the diagonals of a rhombus
   - are not equal,
   - divide each other into halves,
   - their intersection makes right angles.
7. Draw a trapezium on the board with its diagonals. Guide them to realize that the diagonals of a trapezium
   - are not equal,
   - do not divide each other into halves,
   - their intersection does not make right angles.
8. Draw a kite on the board with its diagonals. Guide them to realize that in a kite
   - the diagonals are not equal,
   - only the long diagonal divides the short diagonal into halves,
   - their intersection makes right angles.



Fun with Maths!

Materials required: Paper or cardboard
Objective of the activity: Making summary of the sides, angles and diagonals of quadrilaterals
With the summary, the students will able to identify the properties of the 6 types of quadrilaterals easily.



TRY THIS!

1. Name these quadrilaterals.

(a) (b) (c)

(d) (e) (f)

2. State the three properties for all quadrilaterals.

3. Fill in the table.

Quadrilateral	Are the opposite sides parallel?	Are the opposite angles equal?	Are the diagonals equal?	Do the diagonals divide each other into half?
Rectangle				
Square				
Parallelogram				
Trapezium				
Rhombus				
Kite				

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Try This!

Get 15 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 142 to 145 in Go Get Maths Workbook P5.

Lesson 2
Drawing quadrilaterals

Lesson objectives
By the end of the lesson, the students should be able to:

1. Draw a quadrilateral with given sides and angles.
2. Draw a quadrilateral with diagonals.

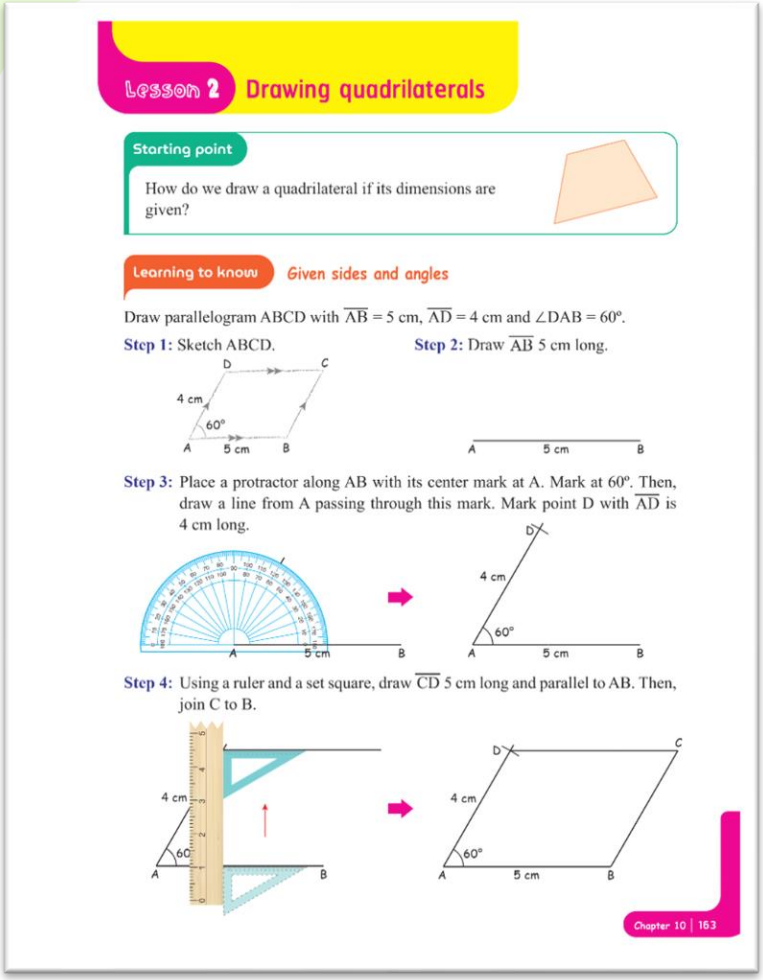
Suggested teaching time
4 periods (4 x 50 minutes)

Vocabulary
-

Materials needed
Protractor, ruler, set square

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Ask the students to read the instruction carefully and sketch the parallelogram.
2. Guide them step by step on how to draw it.
3. Ask them to use the protractor to get the angles and the set square to draw parallel lines.



Lesson 2 Drawing quadrilaterals

Starting point

How do we draw a quadrilateral if its dimensions are given?

Learning to know Given sides and angles

Draw parallelogram ABCD with $\overline{AB} = 5$ cm, $\overline{AD} = 4$ cm and $\angle DAB = 60°$.

Step 1: Sketch ABCD.

Step 2: Draw $\overline{AB}$ 5 cm long.

Step 3: Place a protractor along AB with its center mark at A. Mark at 60°. Then, draw a line from A passing through this mark. Mark point D with $\overline{AD}$ is 4 cm long.

Step 4: Using a ruler and a set square, draw $\overline{CD}$ 5 cm long and parallel to AB. Then, join C to B.

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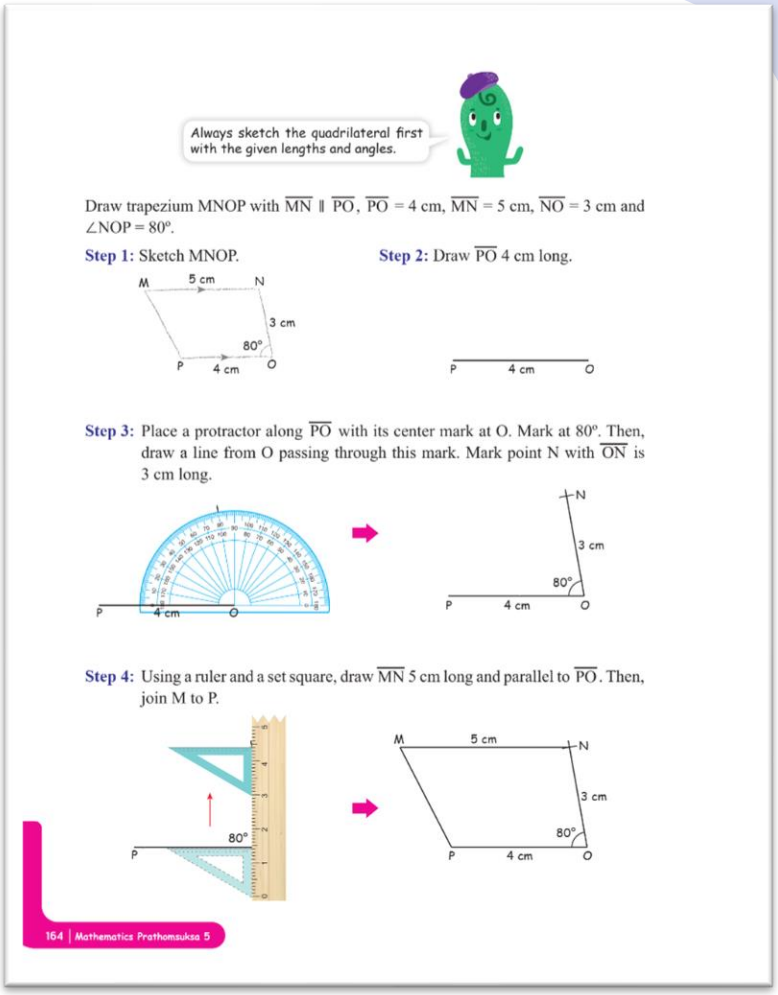
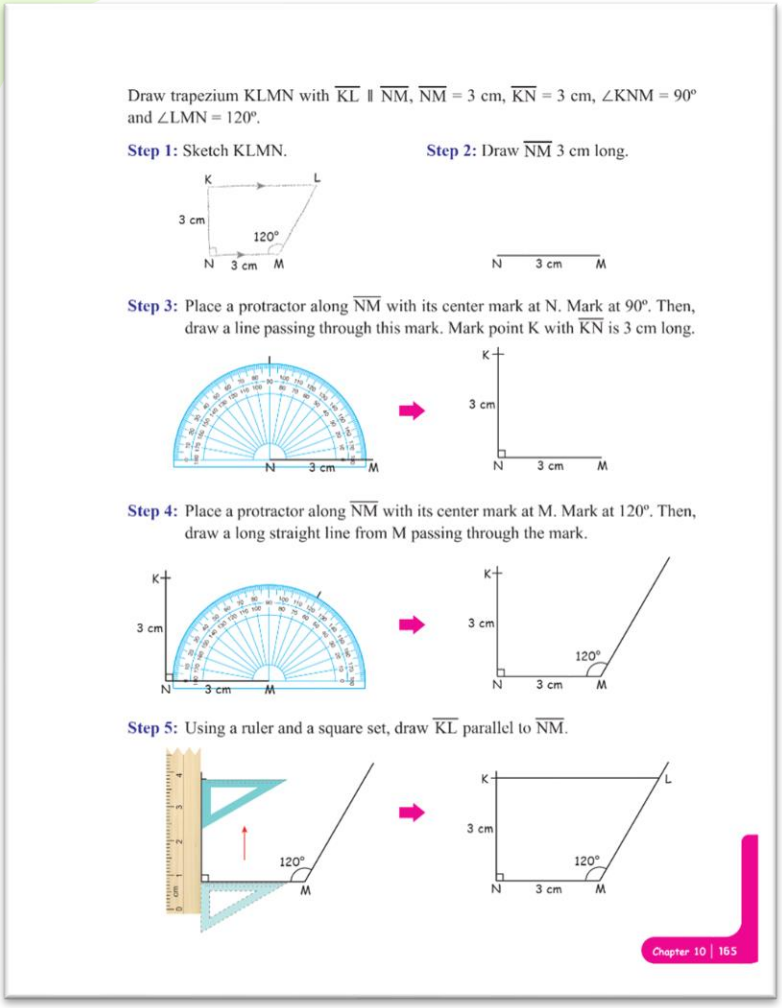


Teaching ideas

4. Ask the students to read the instruction carefully and sketch the trapezium.
5. Guide them step by step on how to draw it.
6. Ask them to use the protractor to get the angles and the set square to draw parallel lines.

Teaching ideas

7. Ask the students to read the instruction carefully and sketch the trapezium.
8. Guide them step by step on how to draw it.
9. Ask them to use the protractor to get the angles and the set square to draw parallel lines.



Draw trapezium KLMN with $\overline{KL} \parallel \overline{NM}$, $\overline{NM}$ = 3 cm, $\overline{KN}$ = 3 cm, ∠KNM = 90° and ∠LMN = 120°.

Step 1: Sketch KLMN.

Step 2: Draw $\overline{NM}$ 3 cm long.

Step 3: Place a protractor along $\overline{NM}$ with its center mark at N. Mark at 90°. Then, draw a line passing through this mark. Mark point K with $\overline{KN}$ is 3 cm long.

Step 4: Place a protractor along $\overline{NM}$ with its center mark at M. Mark at 120°. Then, draw a long straight line from M passing through the mark.

Step 5: Using a ruler and a square set, draw $\overline{KL}$ parallel to $\overline{NM}$.

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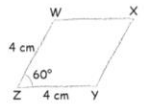
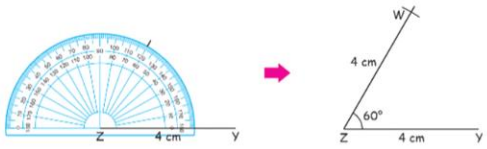
Draw rhombus WXYZ with sides of 4 cm each and ∠WZY = 60°.

Step 1: Sketch WXYZ.

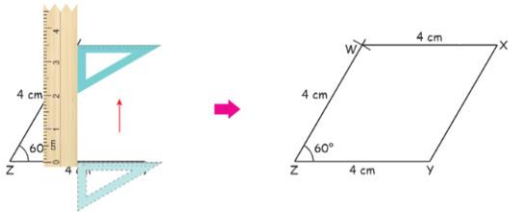


Step 2: Draw $\overline{ZY}$ 4 cm long.

Step 3: Place a protractor along $\overline{ZY}$ with its center mark at Z. Mark at 60°. Then, draw a line from Z passing through this mark. Mark point W with $\overline{WZ}$ is 4 cm long.



Step 4: Using a ruler and a set square, draw $\overline{WX}$ 4 cm long and parallel to $\overline{ZY}$. Then, join X to Y.

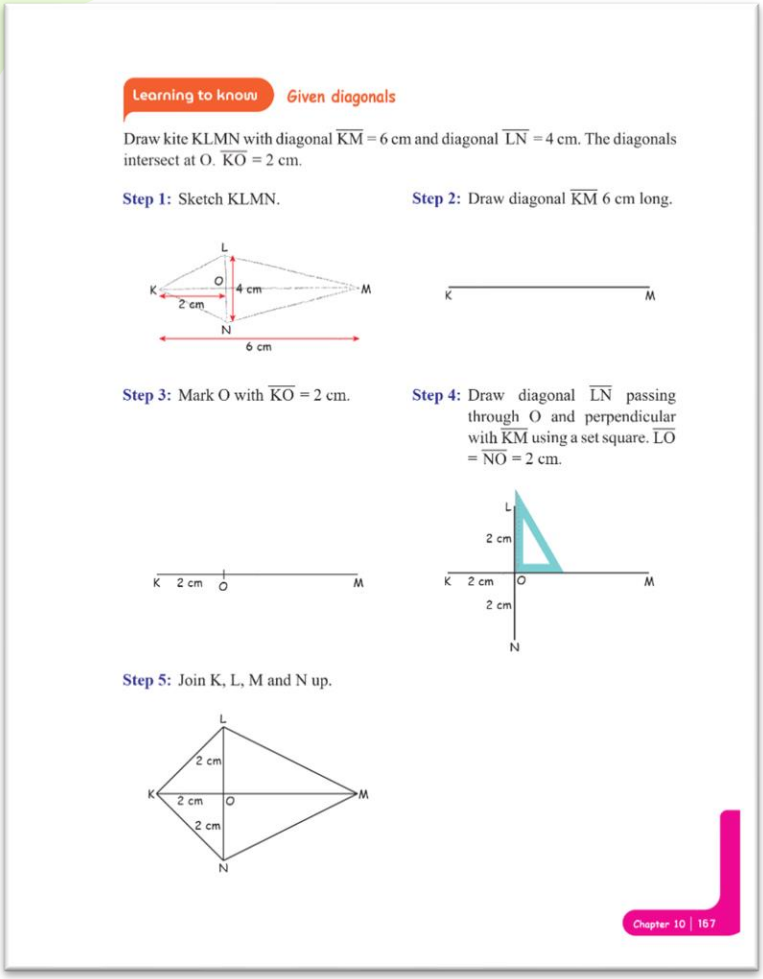


Teaching ideas

10. Ask the students to read the instruction carefully and sketch the rhombus.
11. Guide them step by step on how to draw it.
12. Ask them to use the protractor to get the angles and the set square to draw parallel lines.

Teaching ideas

1. Ask the students to read the instruction carefully and sketch the kite.
2. Guide them step by step on how to draw it.
3. Tell them that they may use the protractor or set square to get the short diagonal that intersects the long diagonal at 90°.
4. Guide the students to refer to **Starting Point** on page 163. Ask them to answer the question. Have a discussion to conclude the lesson.



Learning to know Given diagonals

Draw kite KLMN with diagonal $\overline{KM}$ = 6 cm and diagonal $\overline{LN}$ = 4 cm. The diagonals intersect at O. $\overline{KO}$ = 2 cm.

Step 1: Sketch KLMN.

Step 2: Draw diagonal $\overline{KM}$ 6 cm long.

Step 3: Mark O with $\overline{KO}$ = 2 cm.

Step 4: Draw diagonal $\overline{LN}$ passing through O and perpendicular with $\overline{KM}$ using a set square. $\overline{LO}$ = $\overline{NO}$ = 2 cm.

Step 5: Join K, L, M and N up.

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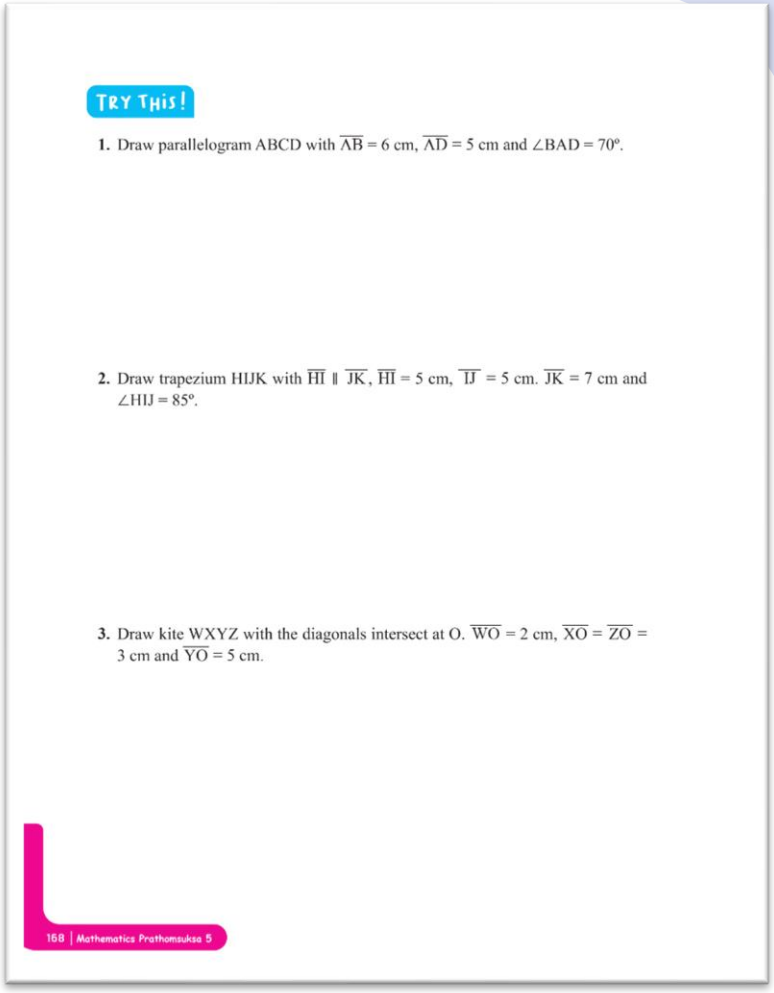

TRY THIS!

1. Draw parallelogram ABCD with $\overline{AB} = 6$ cm, $\overline{AD} = 5$ cm and $\angle BAD = 70°$.

2. Draw trapezium HIJK with $\overline{HI} \parallel \overline{JK}$, $\overline{HI} = 5$ cm, $\overline{IJ} = 5$ cm. $\overline{JK} = 7$ cm and $\angle HIJ = 85°$.

3. Draw kite WXYZ with the diagonals intersect at O. $\overline{WO} = 2$ cm, $\overline{XO} = \overline{ZO} = 3$ cm and $\overline{YO} = 5$ cm.

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Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 146 to 148 in Go Get Maths Workbook P5.

Lesson 3
Angles in quadrilaterals

Lesson objectives
By the end of the lesson, the students should be able to:

1. Find unknown angles in quadrilaterals.

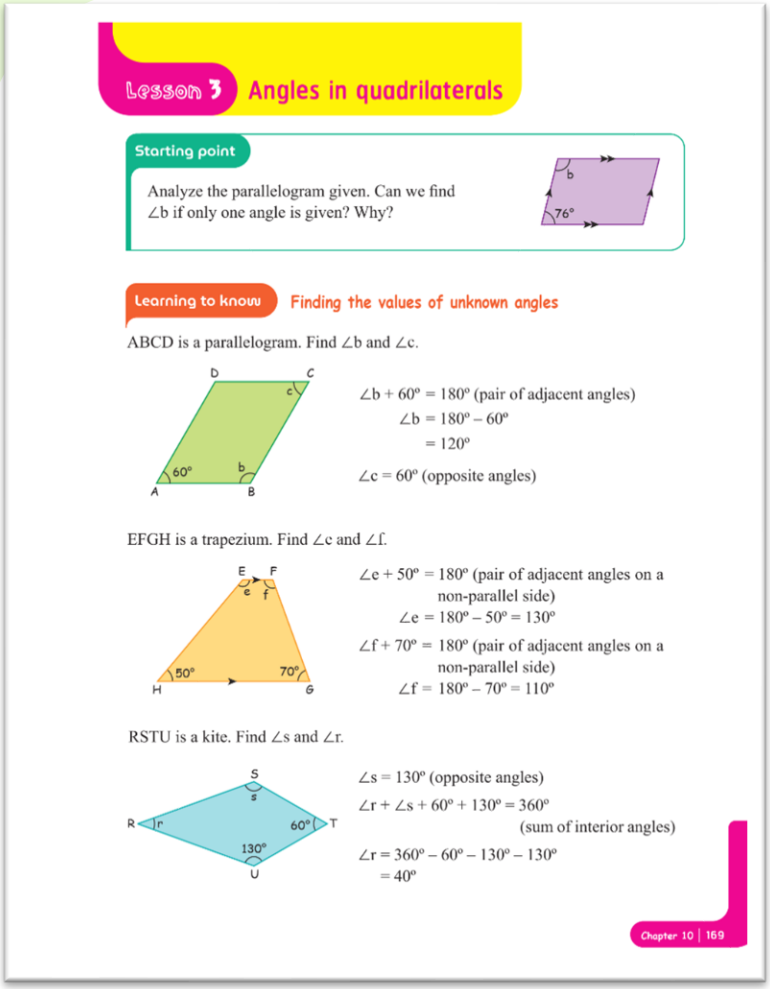
Suggested teaching time
4 periods (4 x 50 minutes)

Vocabulary
Adjacent angles, opposite angles, parallel sides, non-parallel sides

Materials needed
-

Starting point
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas
1. Ask every student to draw a quadrilateral on a piece of paper. Then, ask them to measure and find the sum of all the angles in the quadrilateral. Tell them that the sum of angles in a quadrilateral is 360°.
2. Draw a square on the board. Ask a student to describe the angles in it. Repeat with a rectangle, parallelogram, trapezium, kite and rhombus.
3. Guide the students to find the unknown angle in each quadrilateral in the examples. Ask them to take note of the type of quadrilateral first before solving it.



Lesson 3 Angles in quadrilaterals

Starting point

Analyze the parallelogram given. Can we find ∠b if only one angle is given? Why?

b, 76°

Learning to know — Finding the values of unknown angles

ABCD is a parallelogram. Find ∠b and ∠c.

D, C, c, 60°, b, A, B

∠b + 60° = 180° (pair of adjacent angles)
∠b = 180° − 60°
= 120°

∠c = 60° (opposite angles)

EFGH is a trapezium. Find ∠e and ∠f.

E, F, e, f, 50°, 70°, H, G

∠e + 50° = 180° (pair of adjacent angles on a non-parallel side)
∠e = 180° − 50° = 130°

∠f + 70° = 180° (pair of adjacent angles on a non-parallel side)
∠f = 180° − 70° = 110°

RSTU is a kite. Find ∠s and ∠r.

S, s, R, r, 60°, T, 130°, U

∠s = 130° (opposite angles)
∠r + ∠s + 60° + 130° = 360° (sum of interior angles)
∠r = 360° − 60° − 130° − 130°
= 40°

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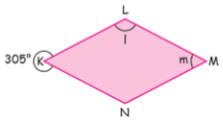
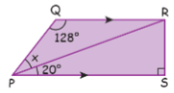
KLMN is a rhombus. Find ∠l and ∠m.



$\angle m = 360° - 305°$ (opposite angles)
$= 55°$

$\angle l + \angle m = 180°$ (pair of adjacent angles)
$\angle l = 180° - 55°$
$= 125°$

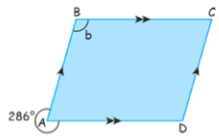
PQRS is a trapezium. Find ∠x.



$\angle x + 20° + 128° = 180°$ (pair of adjacent angles on a non-parallel side)
$\angle x = 180° - 128° - 20°$
$= 32°$

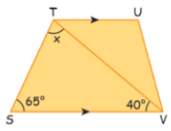
TRY THIS!

1. ABCD is a parallelogram. Find ∠b.



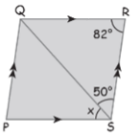
∠b = ☐

2. STUV is a trapezium. Find ∠x.



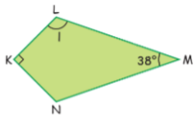
∠x = ☐

3. PQRS is a rhombus. Find ∠x.



∠x = ☐

4. KLMN is a kite. Find ∠l.



∠l = ☐

Teaching ideas

1. Guide the students to find the unknown angle in each quadrilateral the examples. Ask them to take note of the type of quadrilateral first before solving it.
2. Guide the students to refer to **Starting Point** on page 169. Ask them to answer the questions. Have a discussion to conclude the lesson.

Try This!

Get 4 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 149 to 152 in Go Get Maths Workbook P5.

Lesson 4
Prisms

Lesson objectives
By the end of the lesson, the students should be able to:
1. Identify the types of prisms.
2. List the properties of prisms.

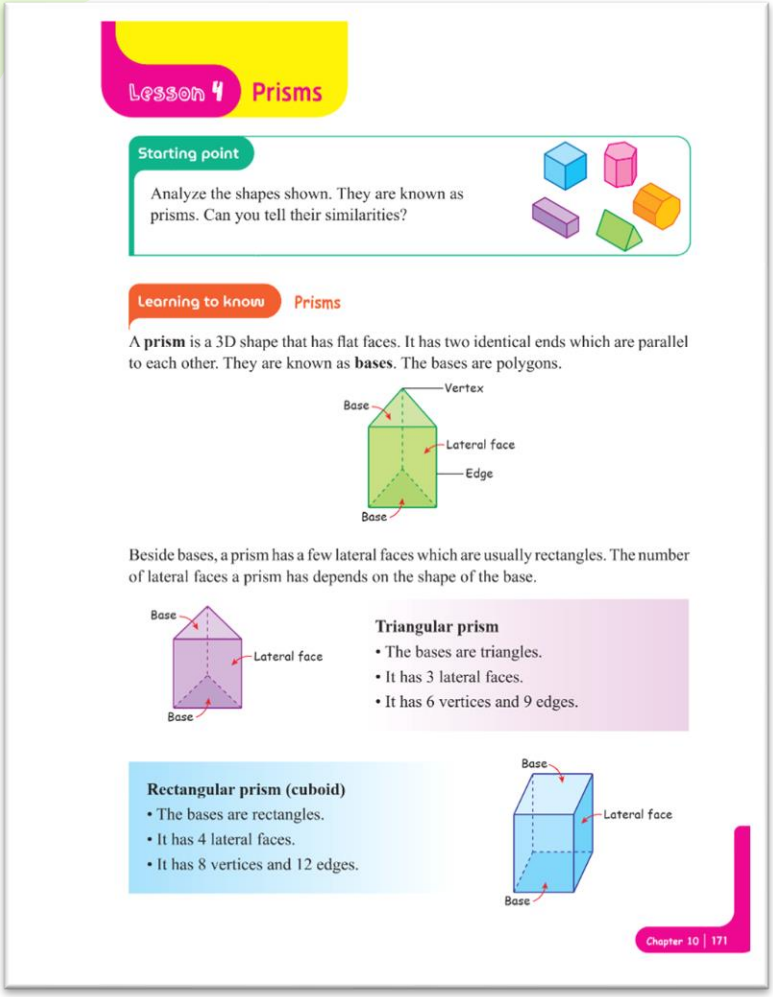
Suggested teaching time
3 periods (3 x 50 minutes)

Vocabulary
Prism, triangular prism, rectangular prism, square prism, pentagonal prism, hexagonal prism

Materials needed
Shoebox, types of prisms

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Show the students a shoebox. Tell them it is a prism. Show them its 2 identical bases and lateral faces. Point to its vertices and edges too.
2. Emphasize that a prism has
   - 2 identical bases that are polygons,
   - lateral faces that are usually rectangles.
3. Show them a triangular prism. Ask some students to point to the identical bases and lateral faces. Count with them the number of lateral faces, vertices and edges. Repeat with a rectangular prism.


Lesson 4 Prisms

Starting point

Analyze the shapes shown. They are known as prisms. Can you tell their similarities?

Learning to know Prisms

A **prism** is a 3D shape that has flat faces. It has two identical ends which are parallel to each other. They are known as **bases**. The bases are polygons.

Vertex, Base, Lateral face, Edge, Base

Beside bases, a prism has a few lateral faces which are usually rectangles. The number of lateral faces a prism has depends on the shape of the base.

Base, Lateral face, Base

Triangular prism
- The bases are triangles.
- It has 3 lateral faces.
- It has 6 vertices and 9 edges.

Rectangular prism (cuboid)
- The bases are rectangles.
- It has 4 lateral faces.
- It has 8 vertices and 12 edges.

Base, Lateral face, Base

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More Tasks

or visit
https://wordwall.net/play/33601/337/515

Teaching ideas

4. Show them a square prism. Ask some students to point to the identical bases and lateral faces. Count with them the number of lateral faces, vertices and edges.
5. Repeat with a pentagonal prism and a hexagonal prism.
6. Ask them to give examples of our daily things that are prisms. For example, hex key or allen key (hexagonal), dice (square prism), shoebox (rectangular prism), tent (triangular prism).
7. Guide the students to refer to **Starting Point** on page 171. Ask them to answer the question. Have a discussion to conclude the lesson.

Thinking Corner!

1. Ask the students the properties of a prism.
2. Ask the students these questions about a cylinder:
   - What is the shape of the 2 identical faces? Are they polygons?
   - What is the shape of the rest of the faces? Are they rectangles?
   - Is a cylinder a prism?
3. Ask the students these questions about a pyramid:
   - Does it have any 2 identical faces?
   - What is the shape of the rest of the faces? Are they rectangles?
   - Is a pyramid a prism?

Fun with Maths!

Materials required: Types of prisms

Objective of the activity: Realizing the relationship among the number of total faces, vertices and edges

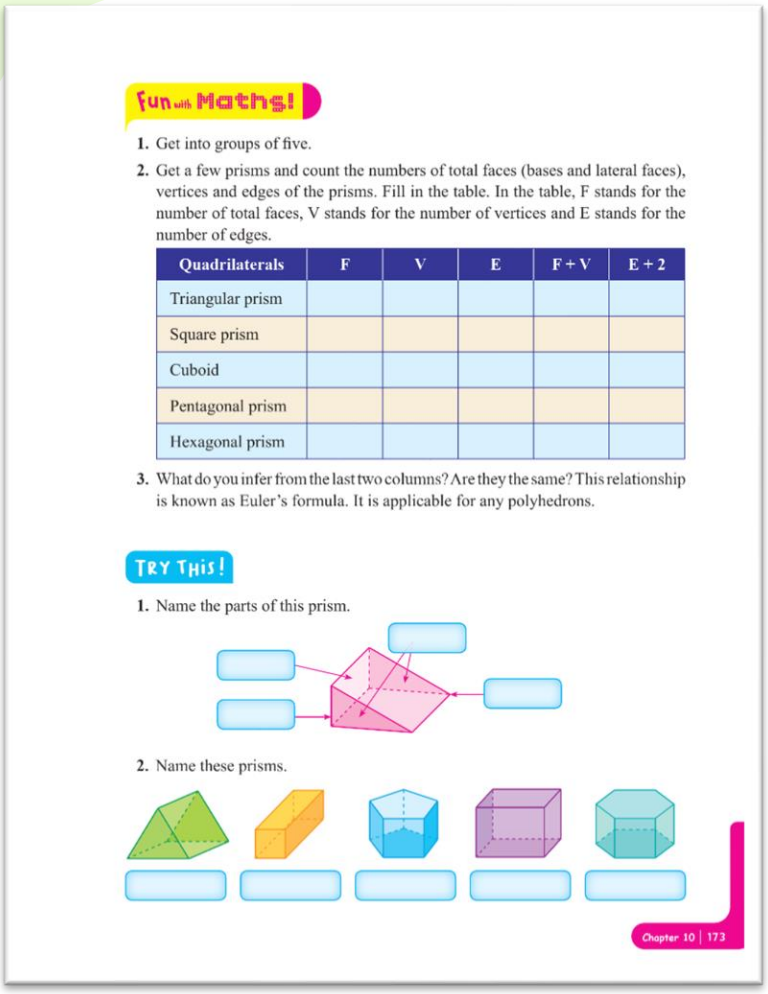
The students will realize the F + V = E + 2 for the prisms. It applies to other polyhedrons too.

Try This!

Get 9 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 153 to 155 in Go Get Maths Workbook P5.



Fun with Maths!

1. Get into groups of five.
2. Get a few prisms and count the numbers of total faces (bases and lateral faces), vertices and edges of the prisms. Fill in the table. In the table, F stands for the number of total faces, V stands for the number of vertices and E stands for the number of edges.

Quadrilaterals	F	V	E	F + V	E + 2
Triangular prism					
Square prism					
Cuboid					
Pentagonal prism					
Hexagonal prism					

3. What do you infer from the last two columns? Are they the same? This relationship is known as Euler's formula. It is applicable for any polyhedrons.

TRY THIS!

1. Name the parts of this prism.

2. Name these prisms.

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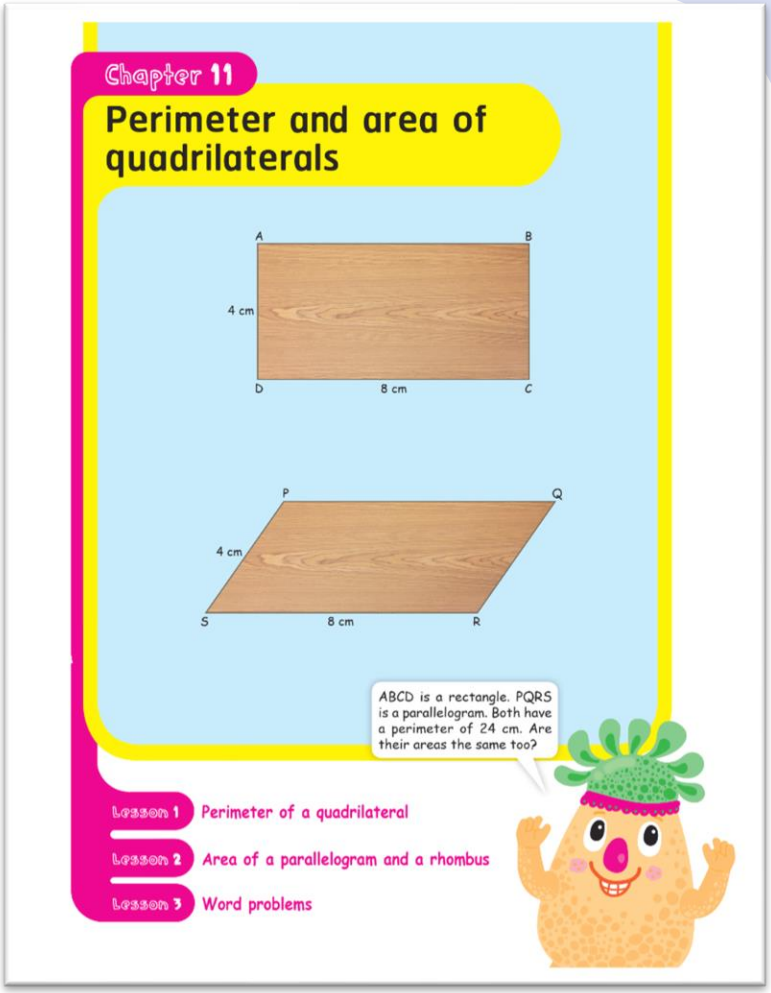


Chapter 11
Perimeter and area of quadrilaterals

The big idea

Ask the students to look at the picture carefully. Ask them these questions to start a discussion:

a) What is the shape of quadrilateral ABCD?

b) What is the shape of quadrilateral PQRS?

c) What is the perimeter of quadrilateral ABCD?

d) What is the perimeter of quadrilateral PQRS?

e) What is the area of quadrilateral ABCD?

f) How do you find the area of quadrilateral PQRS?

Strand 2: Measurement and geometry

Standard M.2.1

Indicators:

M 2.1 Gr5/4 Show mathematical methods of finding the answers of word problems involving the perimeter of quadrilaterals and areas of parallelograms and rhombuses.

Lesson 1
Perimeter of a quadrilateral

Lesson objectives
By the end of the lesson, the students should be able to:
1. Find the perimeter of a quadrilateral.
2. Find the length of the unknown side of a quadrilateral.

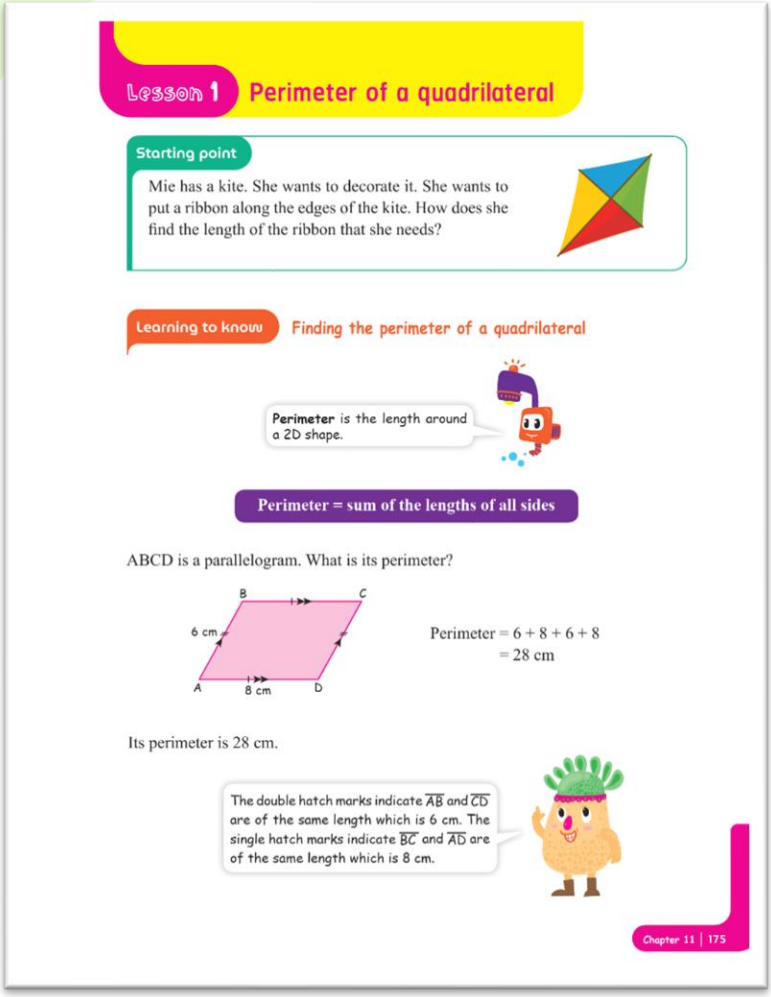
Suggested teaching time
4 periods (4 x 50 minutes)

Vocabulary
Perimeter, quadrilateral, parallelogram, trapezium, kite, rhombus

Materials needed
-

Starting point
Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas
1. Help the students to recall what perimeter of a shape is.
2. Draw a rectangle on the board with its length and width. Ask a volunteer to show how to find its perimeter.
3. Tell the students that the perimeter of a shape is length around it.
4. Use the example to explain further.
5. Guide them to understand the marks on the diagrams that indicate the similar sides.


Lesson 1 Perimeter of a quadrilateral

Starting point

Mie has a kite. She wants to decorate it. She wants to put a ribbon along the edges of the kite. How does she find the length of the ribbon that she needs?

Learning to know Finding the perimeter of a quadrilateral

Perimeter is the length around a 2D shape.

Perimeter = sum of the lengths of all sides

ABCD is a parallelogram. What is its perimeter?

B C 6 cm A 8 cm D

Perimeter = 6 + 8 + 6 + 8
= 28 cm

Its perimeter is 28 cm.

The double hatch marks indicate $\overline{AB}$ and $\overline{CD}$ are of the same length which is 6 cm. The single hatch marks indicate $\overline{BC}$ and $\overline{AD}$ are of the same length which is 8 cm.

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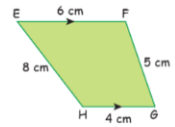
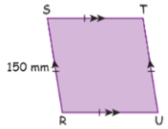
EFGH is a trapezium. What is its perimeter?



Perimeter = 6 + 5 + 4 + 8
= 23 cm

Its perimeter is 23 cm.

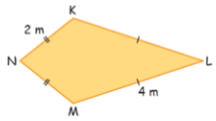
Find the perimeter of rhombus RSTU.



Perimeter = 150 + 150 + 150 + 150
= 600 mm

The perimeter of rhombus RSTU is 600 mm.

Find the perimeter of kite KLMN.

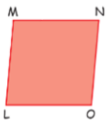


Perimeter = 2 + 4 + 4 + 2
= 12 m

The perimeter of kite KLMN is 12 m.

Learning to know Finding the length of the unknown side

The perimeter of rhombus LMNO is 16 m. Find the length of $\overline{MN}$.



$\overline{MN}$ = 16 ÷ 4
= 4 m

$\overline{MN}$ is 4 m long.

Teaching ideas

6. Get some students to describe the properties of the sides of a parallelogram, trapezium, rhombus and kite.
7. Use the examples to guide the students to find the perimeter.

Teaching ideas

1. Guide the students to find the length of the unknown side of rhombus LMNO. Help them to recall that a rhombus has equal sides. Since all the sides of a rhombus are equal, therefore, the perimeter of the rhombus will be 4 times its side.

Teaching ideas

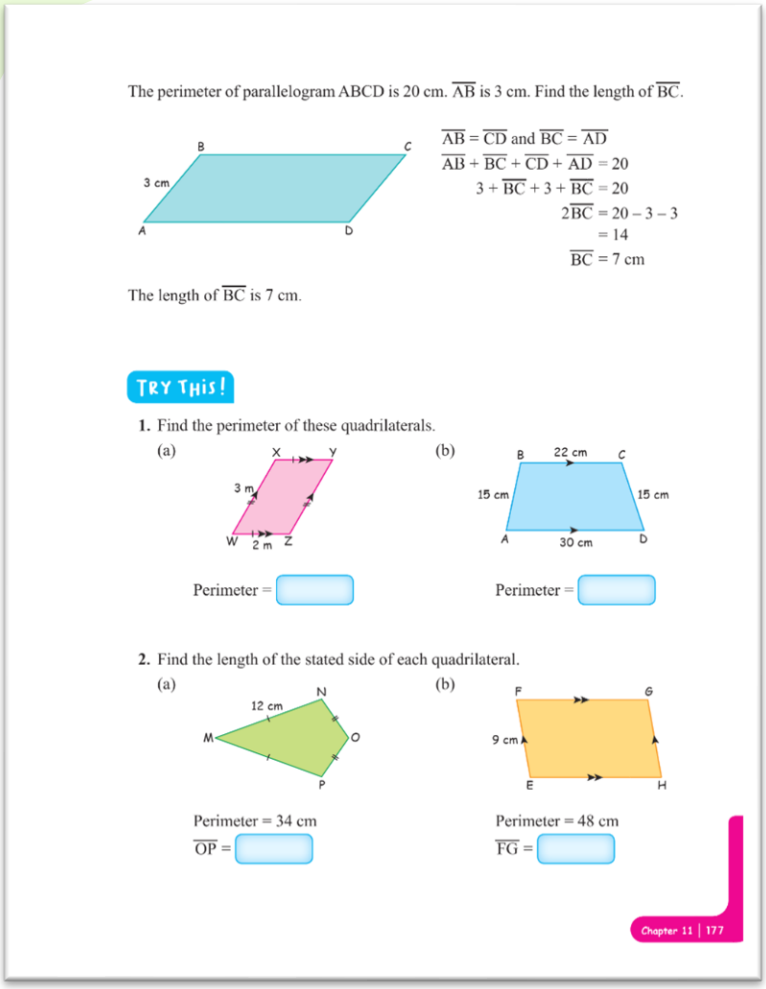
2. Guide the students to find the length of the unknown side of parallelogram ABCD. Help them to recall that the opposite sides of a parallelogram are equal.
3. Guide the students to refer to **Starting Point** on page 175. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 4 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 156 to 158 in Go Get Maths Workbook P5.



The perimeter of parallelogram ABCD is 20 cm. $\overline{AB}$ is 3 cm. Find the length of $\overline{BC}$.

$\overline{AB} = \overline{CD}$ and $\overline{BC} = \overline{AD}$

$\overline{AB} + \overline{BC} + \overline{CD} + \overline{AD} = 20$

$3 + \overline{BC} + 3 + \overline{BC} = 20$

$2\overline{BC} = 20 - 3 - 3$

$= 14$

$\overline{BC} = 7$ cm

The length of $\overline{BC}$ is 7 cm.

TRY THIS!

1. Find the perimeter of these quadrilaterals.

(a)

Perimeter =

(b)

Perimeter =

2. Find the length of the stated side of each quadrilateral.

(a)

Perimeter = 34 cm

$\overline{OP}$ =

(b)

Perimeter = 48 cm

$\overline{FG}$ =

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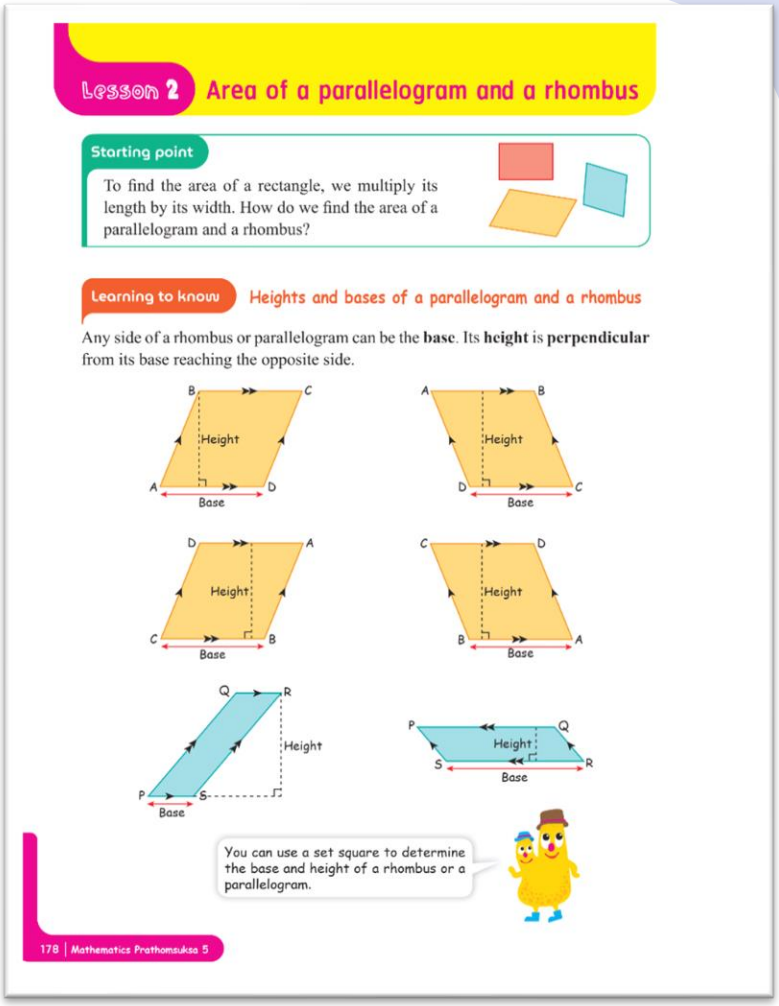
or visit
https://wordwall.net/play/33604/953/663



Lesson 2 Area of a parallelogram and a rhombus

Starting point

To find the area of a rectangle, we multiply its length by its width. How do we find the area of a parallelogram and a rhombus?

Learning to know Heights and bases of a parallelogram and a rhombus

Any side of a rhombus or parallelogram can be the **base**. Its **height** is **perpendicular** from its base reaching the opposite side.

Height
Base

You can use a set square to determine the base and height of a rhombus or a parallelogram.

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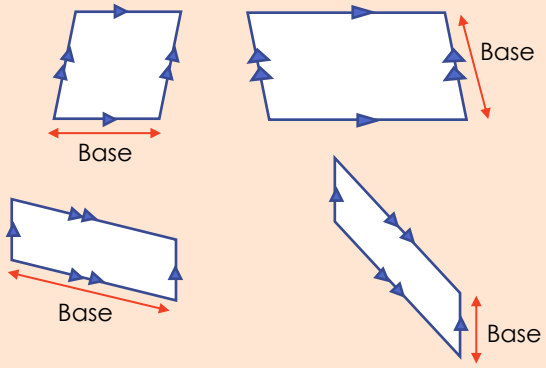
Activity for Reinforcement

Draw these parallelograms and rhombuses on the board with their bases. Ask a volunteer to identify the height of the first rhombus. Ask others for the heights of the other parallelograms.



Lesson 2
Area of a parallelogram and a rhombus

Lesson objectives

By the end of the lesson, the students should be able to:

1. Identify the heights and bases of a parallelogram and a rhombus.
2. Find the area of a parallelogram.
3. Find the area of a rhombus.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

Base, height, perpendicular

Materials needed

Paper

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Tell the students that before we can find the area of a parallelogram or a rhombus, we need to identify its base and height first.
2. Tell them that any side of a parallelogram or a rhombus can be the base. Its height is the perpendicular from the base to the opposite side.
3. The base and the height cross each other at a right angle.
4. Use the examples to explain further.

Try This!

Get 2 students to answer it. Ask the rest to verify the answers.

Further practices

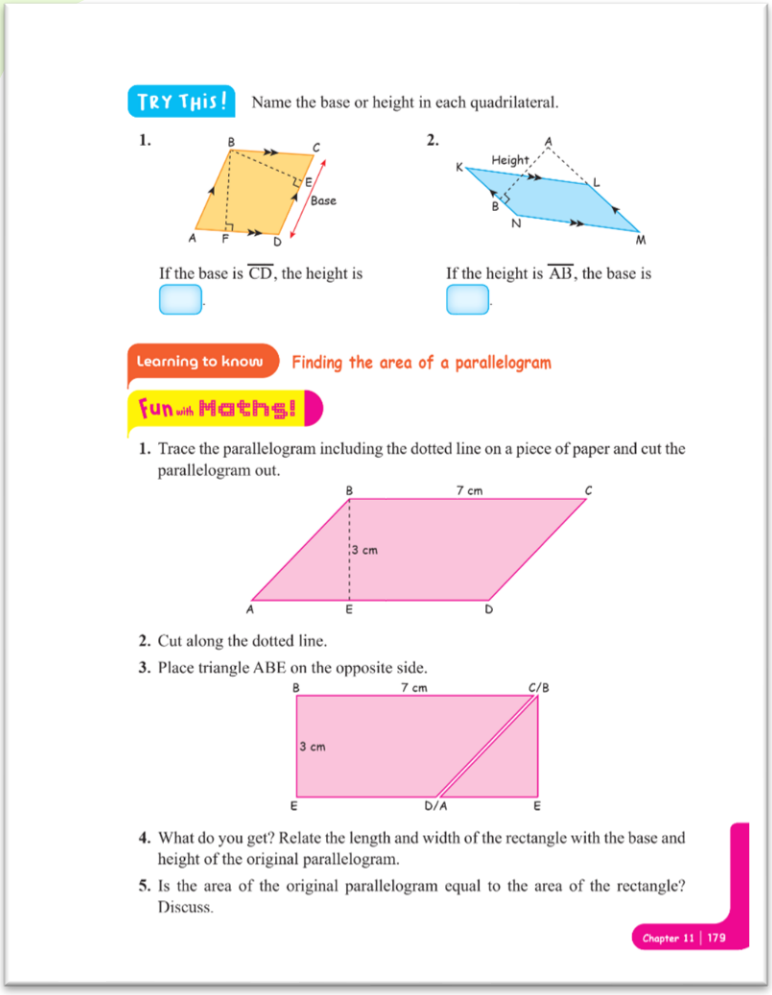
Get the students to complete the practices on page 159 in Go Get Maths Workbook P5.

Fun with Maths!

Materials required: Paper

Objective of the activity: Deriving the formula for area of a parallelogram

After this activity, the students will realize that they can turn a parallelogram into a rectangle. Ask the students to repeat with a rhombus.



TRY THIS! Name the base or height in each quadrilateral.

1.

2.

If the base is $\overline{CD}$, the height is ____.

If the height is $\overline{AB}$, the base is ____.

Learning to know: Finding the area of a parallelogram

Fun with Maths!

1. Trace the parallelogram including the dotted line on a piece of paper and cut the parallelogram out.

2. Cut along the dotted line.
3. Place triangle ABE on the opposite side.

4. What do you get? Relate the length and width of the rectangle with the base and height of the original parallelogram.
5. Is the area of the original parallelogram equal to the area of the rectangle? Discuss.

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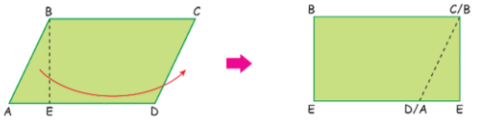
More Info

or visit
http://tiny.cc/60qsuz

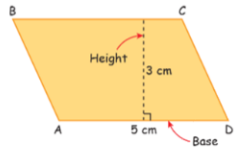
We can construct a rectangle from a parallelogram by moving a right triangle from one side of the parallelogram to the other side.



The area of the parallelogram is the same as the area of the corresponding rectangle.

Area of a parallelogram = height × base

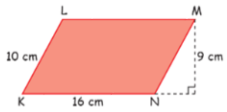
Find the area of parallelogram ABCD.



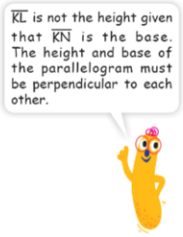
Area of parallelogram ABCD
= height × base
= 3 × 5
= 15 cm²

The area of parallelogram ABCD is 15 cm².

Find the area of parallelogram KLMN.



Area = 9 × 16
= 144 cm²



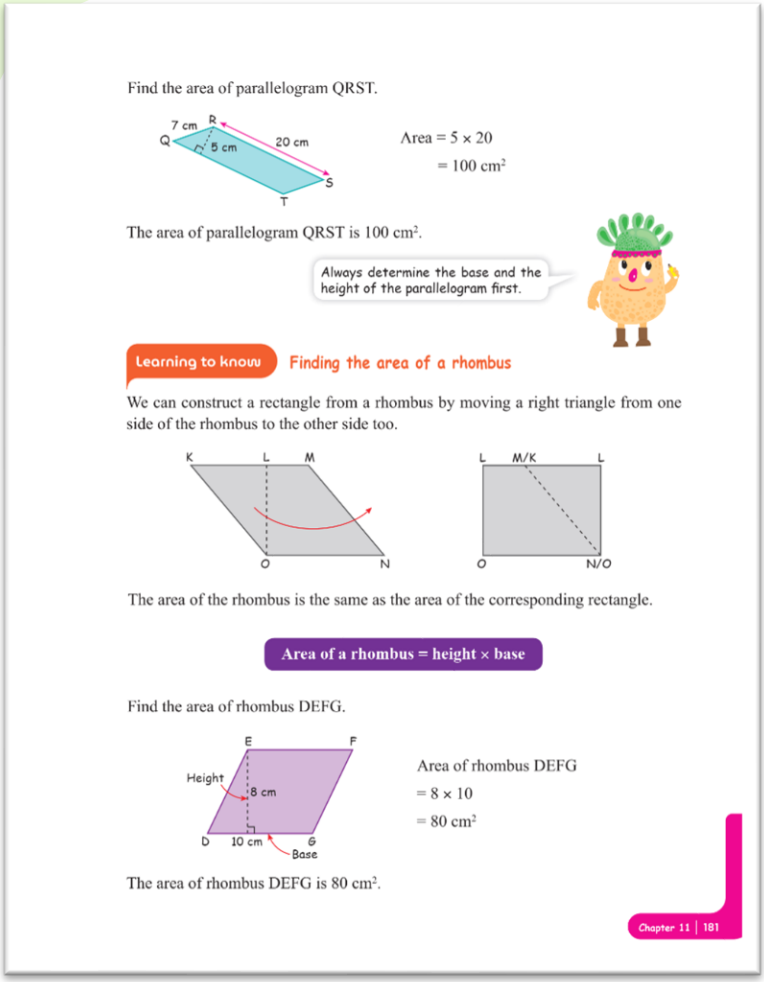
The area of parallelogram KLMN is 144 cm².

Teaching ideas

1. Guide the students to realize that we can reconstruct a parallelogram into a rectangle. From here, tell them that we can use the formula of area for a rectangle on a parallelogram.
2. Ask them for the formula of area for a rectangle.
3. Use the diagrams in the book to show the corresponding height in the rectangle reconstructed from a parallelogram.
4. Guide them to realize that we need to multiply the base by the height of the parallelogram to find its area.
5. Use the examples to explain further. Reiterate that the height of the parallelogram is perpendicular to its base.

Teaching ideas

6. Use the example to explain further. Reiterate that the height of the parallelogram is perpendicular to its base.
7. Remind the students to determine the base and height of a parallelogram before calculating its area.



Find the area of parallelogram QRST.

Area = 5 × 20
= 100 cm²

The area of parallelogram QRST is 100 cm².

Always determine the base and the height of the parallelogram first.

Learning to know — Finding the area of a rhombus

We can construct a rectangle from a rhombus by moving a right triangle from one side of the rhombus to the other side too.

The area of the rhombus is the same as the area of the corresponding rectangle.

Area of a rhombus = height × base

Find the area of rhombus DEFG.

Area of rhombus DEFG
= 8 × 10
= 80 cm²

The area of rhombus DEFG is 80 cm².

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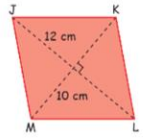
Teaching ideas

1. Guide the students to realize that we can reconstruct a rhombus into a rectangle. From here, tell them that we can use the formula of area for a rectangle on a rhombus.
2. Ask them for the formula of area for a rectangle.
3. Use the diagrams in the book to show the corresponding height in the rectangle reconstructed from a rhombus.
4. Guide them to realize that we need to multiply the base by the height of the rhombus to find its area.
5. Use the example to explain further. Reiterate that the height of the rhombus is perpendicular to its base.

We can also calculate the area of a rhombus using its diagonals.

Area of a rhombus = $\frac{1}{2} \times d_1 \times d_2$
whereby d_1 = the first diagonal
d_2 = the second diagonal

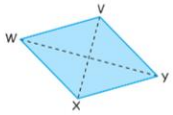
JKLM is a rhombus. Find its area if $\overline{JL}$ = 12 cm and $\overline{KM}$ = 10 cm.



Area of rhombus JKLM
$= \frac{1}{2} \times d_1 \times d_2$
$= \frac{1}{2} \times 12 \times 10$
$= 60 \text{ cm}^2$

The area of rhombus JKLM is 60 cm².

VWXY is a rhombus. $\overline{WY}$ = 50 mm and $\overline{VX}$ = 35 mm. Find its area.

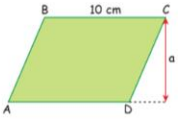


Area of rhombus VWXY
$= \frac{1}{2} \times 50 \times 35$
$= 875 \text{ mm}^2$

The area of rhombus VWXY is 875 mm².

Learning to know Finding the length of the unknown base or height or diagonal

ABCD is a parallelogram with an area of 70 cm². Find a.



$10 \times a = 70$
$a = 70 \div 10$
$= 7 \text{ cm}$

Teaching ideas

6. Inform the students that we can find the area of a rhombus using its diagonals.
7. Introduce the formula to find the area of a rhombus using the diagonals.
8. Draw a rhombus on the board with its diagonals. Guide them to find its area using the diagonals.
9. Use the examples to explain further.

Teaching ideas

1. Inform the students that we can find the base or height or the diagonal if the area of a parallelogram or rhombus is given.
2. Use the example to explain.

Teaching ideas

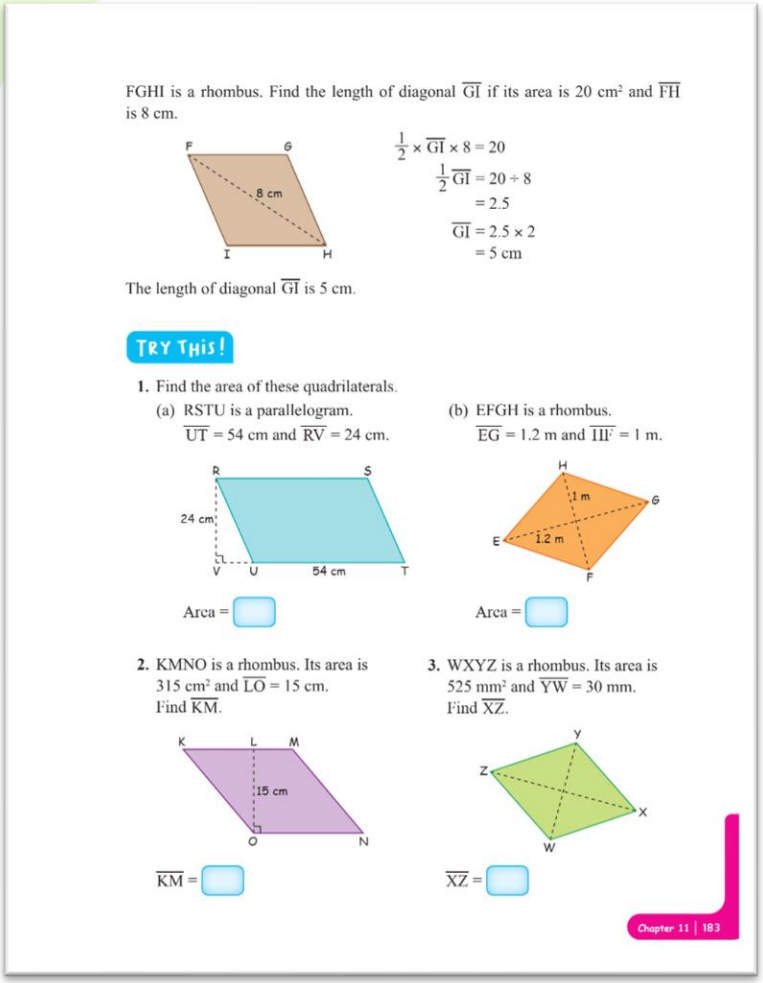
3. Use the example to explain.
4. Guide the students to refer to **Starting Point** on page 178. Ask them to answer the question. Have a discussion to conclude the lesson.

Try This!

Get 4 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 160 to 162 in Go Get Maths Workbook P5.



FGHI is a rhombus. Find the length of diagonal $\overline{GI}$ if its area is 20 cm² and $\overline{FH}$ is 8 cm.

$\frac{1}{2} \times \overline{GI} \times 8 = 20$

$\frac{1}{2}\overline{GI} = 20 \div 8$

$= 2.5$

$\overline{GI} = 2.5 \times 2$

$= 5$ cm

The length of diagonal $\overline{GI}$ is 5 cm.

TRY THIS!

1. Find the area of these quadrilaterals.

(a) RSTU is a parallelogram. $\overline{UT}$ = 54 cm and $\overline{RV}$ = 24 cm.

Area =

(b) EFGH is a rhombus. $\overline{EG}$ = 1.2 m and $\overline{HF}$ = 1 m.

Area =

2. KMNO is a rhombus. Its area is 315 cm² and $\overline{LO}$ = 15 cm. Find $\overline{KM}$.

$\overline{KM}$ =

3. WXYZ is a rhombus. Its area is 525 mm² and $\overline{YW}$ = 30 mm. Find $\overline{XZ}$.

$\overline{XZ}$ =

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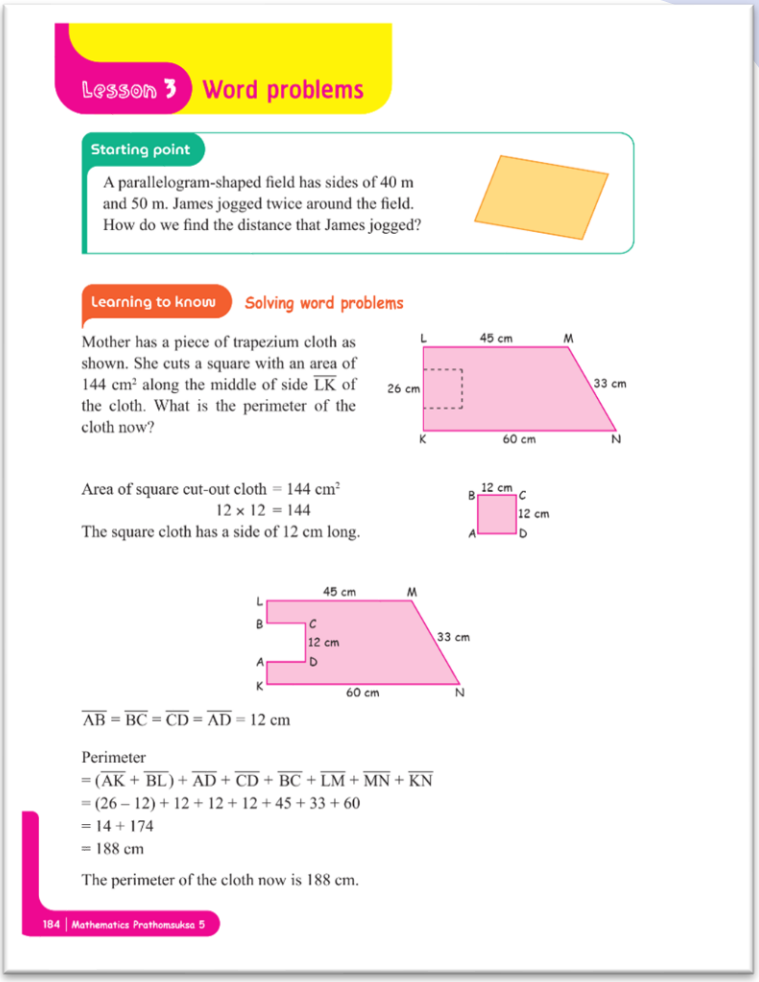

Lesson 3 Word problems

Starting point

A parallelogram-shaped field has sides of 40 m and 50 m. James jogged twice around the field. How do we find the distance that James jogged?

Learning to know Solving word problems

Mother has a piece of trapezium cloth as shown. She cuts a square with an area of 144 cm² along the middle of side $\overline{LK}$ of the cloth. What is the perimeter of the cloth now?

Area of square cut-out cloth = 144 cm²

$12 \times 12 = 144$

The square cloth has a side of 12 cm long.

$\overline{AB} = \overline{BC} = \overline{CD} = \overline{AD} = 12$ cm

Perimeter

$= (\overline{AK} + \overline{BL}) + \overline{AD} + \overline{CD} + \overline{BC} + \overline{LM} + \overline{MN} + \overline{KN}$

$= (26 - 12) + 12 + 12 + 12 + 45 + 33 + 60$

$= 14 + 174$

$= 188$ cm

The perimeter of the cloth now is 188 cm.

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Lesson 3
Word problems

Lesson objectives

By the end of the lesson, the students should be able to:

1. Solve word problems involving perimeter and area of a parallelogram or a rhombus.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

-

Materials needed

-

Starting point

Help the students to understand the question. Ask them if they know the answer and what they will learn today.

Teaching ideas

1. Reiterate the 3 simple steps to solve a word problem.
   Step 1: Understand the problem
   Step 2: Plan and execute
   Step 3: Check the answer

2. Work with them the 3 steps in solving the word problems. Ask them to always check their answers.

Teaching ideas

3. Work with them the 3 steps in solving the word problems. Ask them to always check their answers.
4. Guide the students to refer to **Starting Point** on page 184. Ask them to answer the question. Have a discussion to conclude the lesson.

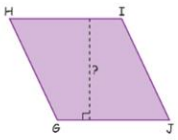
There is a piece of rhombus paper. The total length of its boundary is 152 cm. What is the perpendicular distance between two opposite sides if its area is 950 cm²?

$\overline{GH} = \overline{HI} = \overline{IJ} = \overline{GJ}$

$4\overline{GH} = 152$

$\overline{GH} = 152 \div 4$

$= 38$ cm



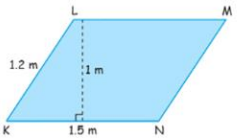
Height × 38 = 950

Height = 950 ÷ 38

= 25 cm

The perpendicular distance between two opposite sides is 25 cm.

A parallelogram card has sides of 1.5 m and 1.2 m. Its height is 1 m from its side of 1.5 m. A rhombus with diagonals of 0.6 m and 0.8 m is cut from the middle of the card. What is the area of the remaining card?



Area of the original card

= 1.5 × 1

= 1.5 m²

Area of the rhombus = $\frac{1}{2} \times 0.6 \times 0.8$

= 0.24 m²

Area of the remaining card = 1.5 – 0.24

= 1.26 m²

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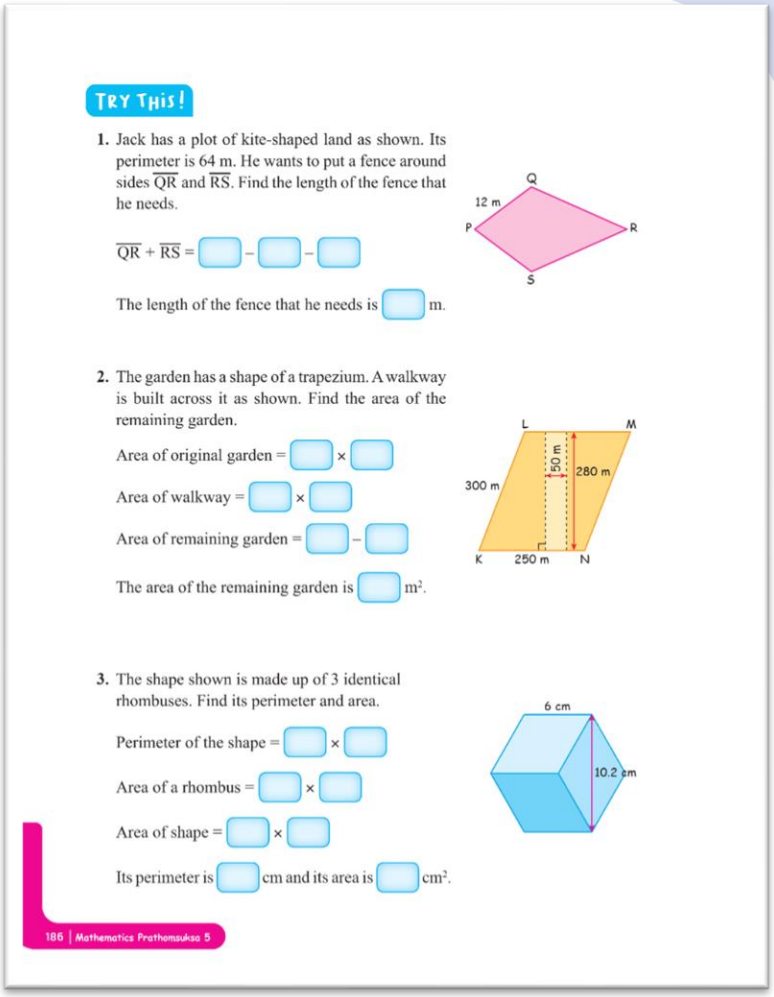


TRY THIS!

1. Jack has a plot of kite-shaped land as shown. Its perimeter is 64 m. He wants to put a fence around sides $\overline{QR}$ and $\overline{RS}$. Find the length of the fence that he needs.

$\overline{QR} + \overline{RS} =$ ☐ − ☐ − ☐

The length of the fence that he needs is ☐ m.

2. The garden has a shape of a trapezium. A walkway is built across it as shown. Find the area of the remaining garden.

Area of original garden = ☐ × ☐

Area of walkway = ☐ × ☐

Area of remaining garden = ☐ − ☐

The area of the remaining garden is ☐ m².

3. The shape shown is made up of 3 identical rhombuses. Find its perimeter and area.

Perimeter of the shape = ☐ × ☐

Area of a rhombus = ☐ × ☐

Area of shape = ☐ × ☐

Its perimeter is ☐ cm and its area is ☐ cm².

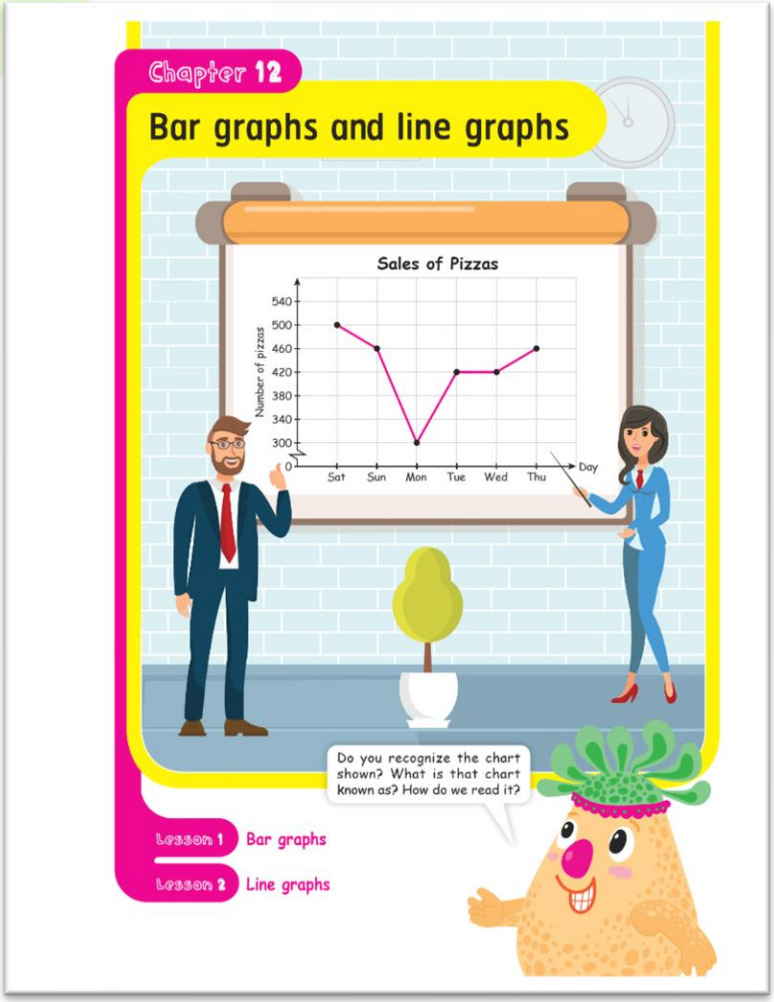
Try This!

Get 3 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 163 to 166 in Go Get Maths Workbook P5.

Chapter 12
Bar graphs and line graphs



The big idea

1. Help the students to recall what a bar graph is:
   a) Ask the students to count the numbers of boys and girls in the class.
   b) Ask each of them to draw a bar graph on a piece of paper.
   c) Then, ask them to pair up and compare the bar graphs they have drawn.
   d) Ask them these questions:
      i. Is the title there?
      ii. Did you label the axes?
      iii. Is the scale on the axis correct?
      iv. Are the heights of the bars correct?

2. Ask the students to look at the picture carefully. Ask them these questions to start a discussion:
   a) Have they seen such a graph?
   b) How is it similar to a bar graph?
   c) What are the differences between this graph with a bar graph?
   d) Does anyone know how to read this graph?

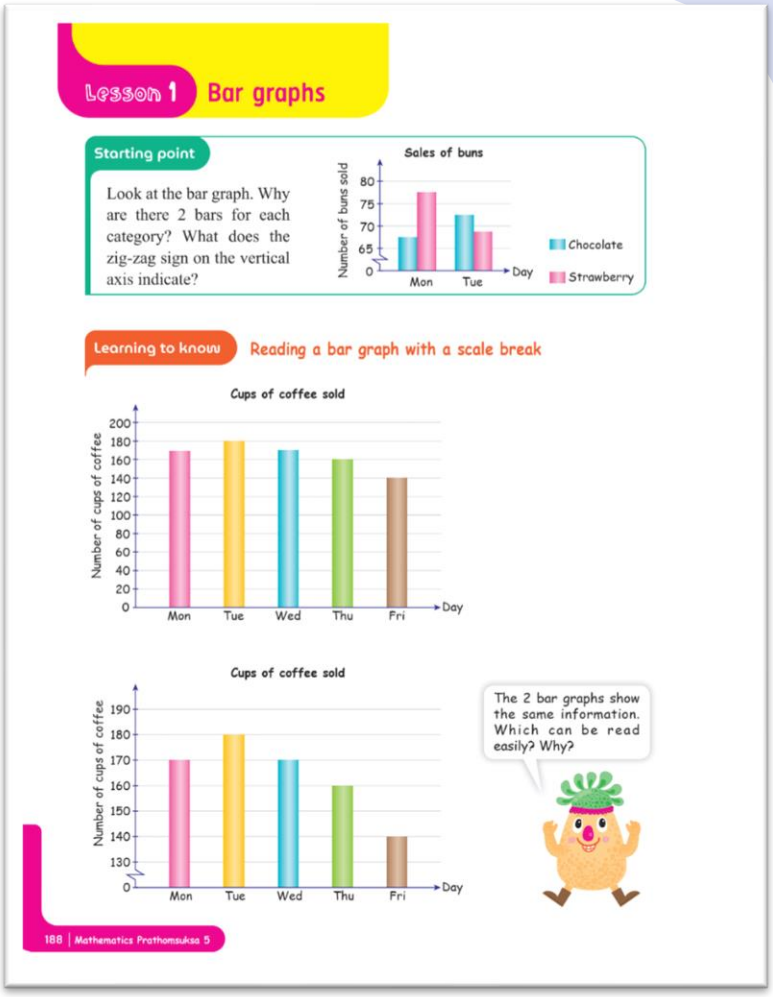
Strand 3: Statistics and probability

Standard M.3.1

Indicators:

M 3.1 Gr5/1 Use data from line graphs to find the answers of word problems.

M 3.1 Gr5/2 Create bar charts by using data of counting numbers.



Lesson 1
Bar graphs

Lesson objectives

By the end of the lesson, the students should be able to:

1. Read bar graphs with a scale break.
2. Read multiple bar graphs.
3. Draw bar graphs.

Suggested teaching time

5 periods (5 x 50 minutes)

Vocabulary

Scale break, multiple bar graph

Materials needed

-

Starting point

Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

1. Ask the students to compare the 2 bar graphs on the book. Both graphs give the same information.
2. Ask them these questions to start a discussion:
   a) Which graph is easier to be read?
   b) Are the heights of the bars in both graphs the same?
   c) Are the axes the same?
   d) Are the intervals on both scales the same?
   e) Why is there a jump in the scale in the second graph?

Teaching ideas

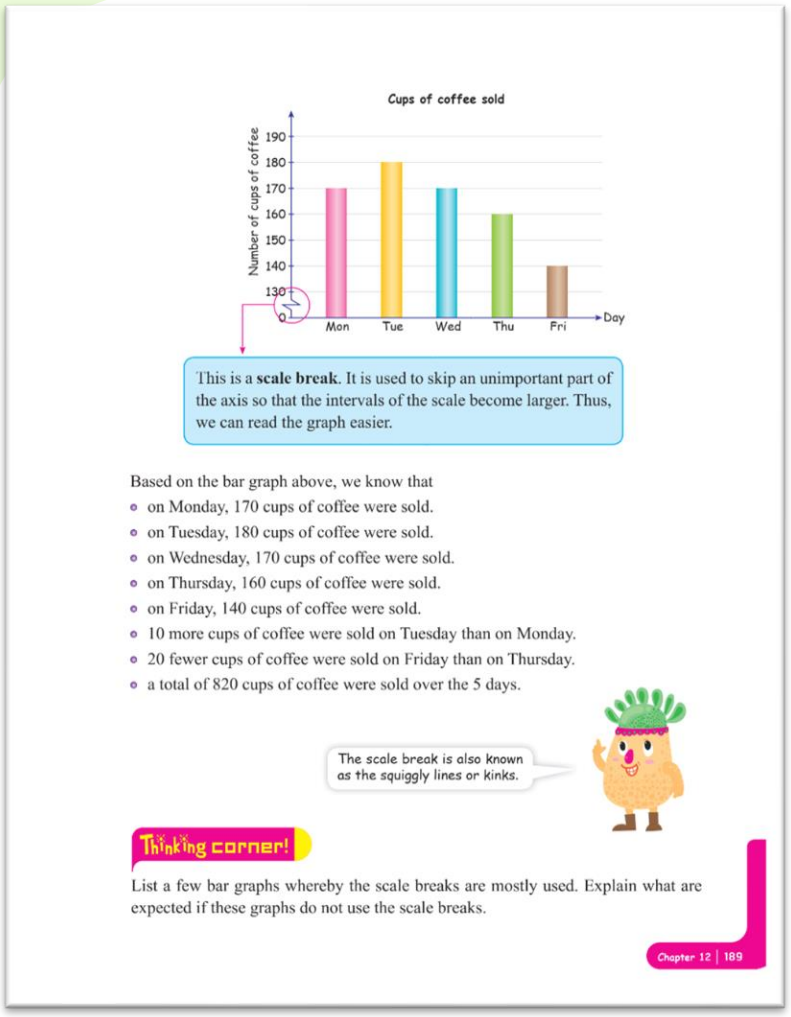
3. Inform the students that the 'jump' in the scale is known as a scale break. It skips usually the early part of the scale that is not the values represented by the bars.
4. Work with them on the graph. Guide them to extract information from the graph.

Thinking Corner!

Ask them to draw 2 bar graphs, one with the scale break and the other without, to represent the information below:

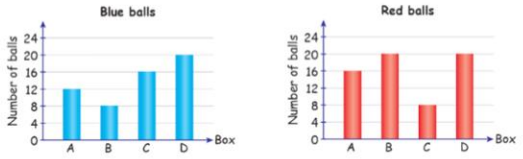
Girls – 380, Boys – 400

Ask them to compare and list the differences.

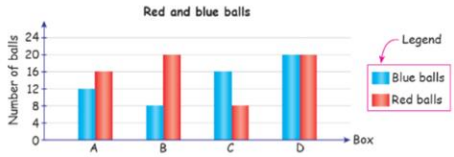


Learning to know **Reading multiple bar graphs**

Box	A	B	C	D
Number of blue balls	12	8	16	20
Number of red balls	16	20	8	20

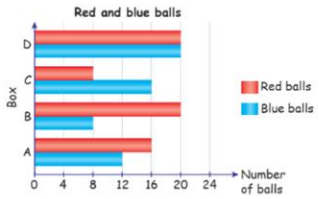


The 2 bar graphs above show the number of blue and red balls in 4 boxes. We can combine the 2 sets of values in a multiple bar graph as shown below.



A **multiple bar graph** allows us to compare 2 or more sets of values easily. Different colored bars are used to represent the different sets of values. A **legend** is used to tell what the colored bars represent.

A multiple bar graph can be drawn horizontally too.



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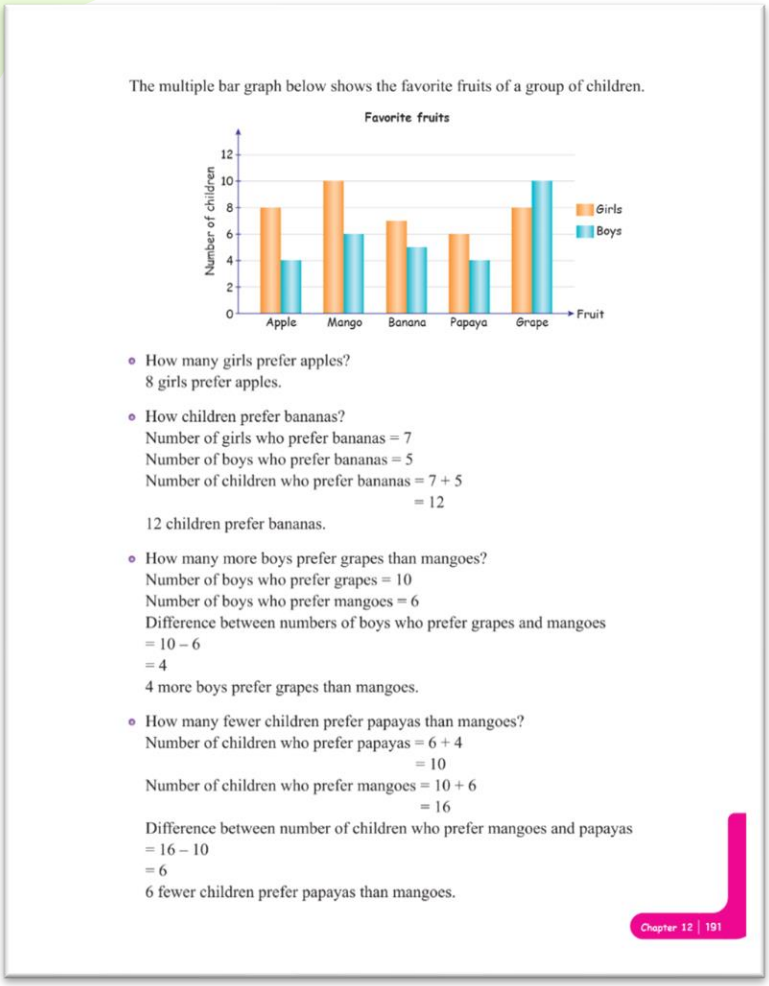
Teaching ideas

1. Inform the students that we can combine 2 related bar graphs into a bar graph. This new bar graph is known as the multiple bar graph.
2. Use the example to explain further. Inform them that different colors or designs are used to represent the different sets of values. A legend is used to indicate it.
3. As usual, a multiple bar graph can be horizontal or vertical.

Teaching ideas

4. Ask them to analyze the graph. Ask them these questions to guide them to understand it first:
   a) What is this graph about? (title)
   b) How many sets of values are there? (number of colors used on the bars)
   c) What do the axes represent?
   d) Is there any scale break?
   e) What does each color of the bars represent? (legend)
5. Go through the questions with them.
6. Ask them these extra questions to gage their understanding:
   a) How many boys prefer papayas?
   b) How many children prefer apples?
   c) How many fewer girls prefer bananas than mangoes?
   d) How many more children prefer grapes than apples?
   e) How many children are there altogether?

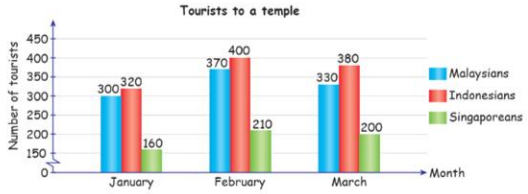


The multiple bar graph below shows the favorite fruits of a group of children.

- How many girls prefer apples?
  8 girls prefer apples.
- How children prefer bananas?
  Number of girls who prefer bananas = 7
  Number of boys who prefer bananas = 5
  Number of children who prefer bananas = 7 + 5
  = 12
  12 children prefer bananas.
- How many more boys prefer grapes than mangoes?
  Number of boys who prefer grapes = 10
  Number of boys who prefer mangoes = 6
  Difference between numbers of boys who prefer grapes and mangoes
  = 10 – 6
  = 4
  4 more boys prefer grapes than mangoes.
- How many fewer children prefer papayas than mangoes?
  Number of children who prefer papayas = 6 + 4
  = 10
  Number of children who prefer mangoes = 10 + 6
  = 16
  Difference between number of children who prefer mangoes and papayas
  = 16 – 10
  = 6
  6 fewer children prefer papayas than mangoes.

Chapter 12 | 191

The multiple bar graph below shows the number of tourists from 3 different countries who visited a temple in the first 3 months of 2021.



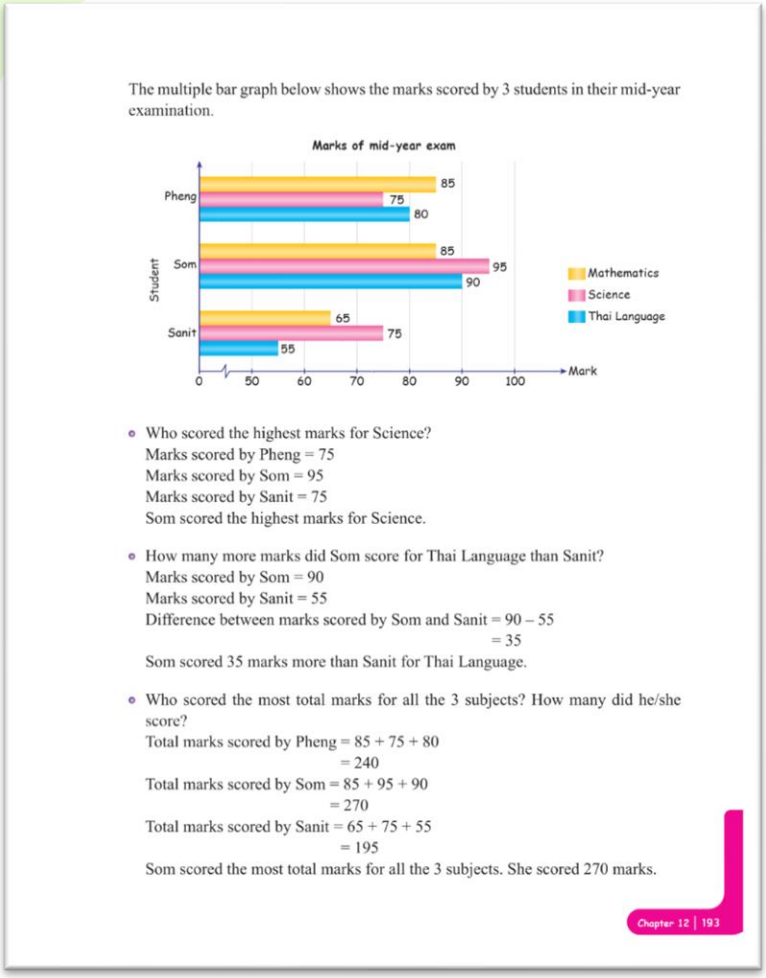
- How many Malaysian tourists visited the temple in the 3 months?
  Number of Malaysian tourists in January = 300
  Number of Malaysian tourists in February = 370
  Number of Malaysian tourists in March = 330
  Total of number of Malaysian tourists in the 3 months = 300 + 370 + 330
  = 1,000
  1,000 Malaysian tourists visited the temple in the 3 months.
- How many more Indonesian tourists than Singaporean tourists visited the temple in February?
  Number of Indonesian tourists in February = 400
  Number of Singaporean tourists in February = 210
  Difference between number of Indonesian tourists and Singaporean tourists in February
  = 400 – 210
  = 190
  190 more Indonesian tourists than Singaporean tourists visited the temple in February.
- In which month did the temple have the most tourists?
  Total number of tourists in January = 300 + 320 + 160
  = 780
  Total number of tourists in February = 370 + 400 + 210
  = 980
  Total number of tourists in March = 330 + 380 + 200
  = 910
  The temple had the most tourists in February.

Teaching ideas

7. Ask them to analyze the graph. Ask them these questions to guide them to understand it first:
   a) What is this graph about? (title)
   b) How many sets of values are there? (number of colors used on the bars)
   c) What do the axes represent?
   d) Is there any scale break?
   e) What does each color of the bars represent? (legend)
8. Go through the questions with them.
9. Ask them these extra questions to gage their understanding:
   a) How many Singaporean tourists visited the temple in the 3 months?
   b) How many fewer Singaporean tourists than Malaysian tourist visited the temple in January?
   c) How many more tourists visited the temple in March than in January?
   d) How many tourists in total visited the temple in January and February?

Teaching ideas

10. Ask them to analyze the graph. Ask them these questions to guide them to understand it first:
    a) What is this graph about? (title)
    b) How many sets of values are there? (number of colors used on the bars)
    c) What do the axes represent?
    d) Is there any scale break?
    e) What does each color of the bars represent? (legend)
11. Go through the questions with them.
12. Ask them these extra questions to gage their understanding:
    a) Who scored the lowest mark Mathematics?
    b) How many more marks did Som score for Science than Mathematics?
    c) How many more marks did Phang score for Thai Language than Sanit?
    d) Which subject did they score the highest in total?



The multiple bar graph below shows the marks scored by 3 students in their mid-year examination.

- Who scored the highest marks for Science?
  Marks scored by Pheng = 75
  Marks scored by Som = 95
  Marks scored by Sanit = 75
  Som scored the highest marks for Science.

- How many more marks did Som score for Thai Language than Sanit?
  Marks scored by Som = 90
  Marks scored by Sanit = 55
  Difference between marks scored by Som and Sanit = 90 – 55
  = 35
  Som scored 35 marks more than Sanit for Thai Language.

- Who scored the most total marks for all the 3 subjects? How many did he/she score?
  Total marks scored by Pheng = 85 + 75 + 80
  = 240
  Total marks scored by Som = 85 + 95 + 90
  = 270
  Total marks scored by Sanit = 65 + 75 + 55
  = 195
  Som scored the most total marks for all the 3 subjects. She scored 270 marks.

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Learning to know Drawing bar graphs

Draw a vertical bar graph to represent the number of each type of different sized shirts sold in 3 days. Use a scale break.

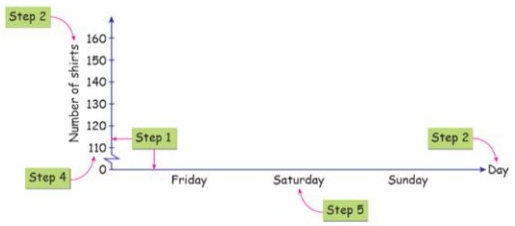
Size	Friday	Saturday	Sunday
L	120	150	150
M	150	140	120
S	140	130	140

Step 3

Step 1: Draw the vertical and horizonal axes.

Step 2: Label the vertical axis as 'Number of shirts'. Label the horizontal axis as 'Day'.

Step 3: Determine the range of values. The greatest value is 150 and the smallest value is 120.



Step 4: Determine the scale. Since the smallest value is 120, we can have a scale break from 0 to110. We can use a scale at intervals of 10. Mark the numbers from 110 to 160 at intervals of 10 on the vertical axis.

Step 5: On the horizontal axis, mark the bars for 'Friday', 'Saturday' and 'Sunday'. Choose similar bar widths and similar gap widths.

Teaching ideas

1. Ask the students to read the instructions carefully. Are they going to draw a vertical or a horizontal multiple bar graph?
2. Guide them to draw the bar graph through the seven steps in the example.

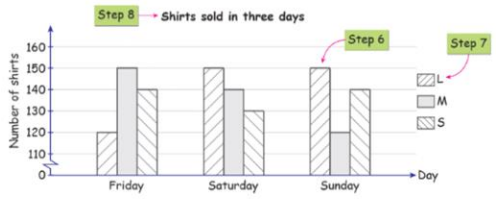
Teaching ideas

3. Guide them to draw the multiple bar graphs through the seven steps they learnt earlier.

Step 6: Draw the bars with their heights representing their values on the scales on the vertical axis. Use different colors or shades or lines to indicate different sets of values.

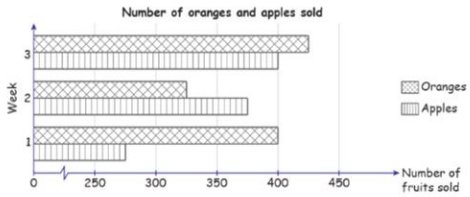
Step 7: Specify what the colors, shades or lines in the bars are representing using a legend.

Step 8: Label the bar graph.



Draw a horizontal multiple bar graph to represent the information below. Use a scale break.

Week	1	2	3
Number of oranges sold	400	325	425
Number of apples sold	275	375	400



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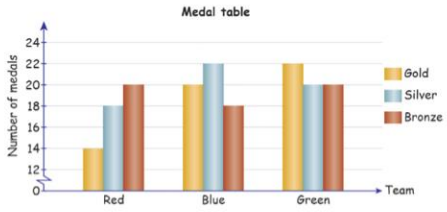
or visit
http://tiny.cc/f0qsuz

Draw a vertical multiple bar graph to represent the information below. Use a scale break.

Number of medals	Red team	Blue team	Green team
Gold	14	20	22
Silver	18	22	20
Bronze	20	18	20



Fun with Maths!

Conduct a survey to find out the number of textbooks, workbooks and exercise books your 3 classmates have. Fill in the table below.

Classmate (name)			
Number of textbooks			
Number of workbooks			
Number of exercise books			

Then, draw a multiple bar graph to present the information. Use a scale break if needed.

Teaching ideas

4. Guide them to draw the multiple bar graphs through the seven steps they learnt earlier.
5. Guide the students to refer to **Starting Point** on page 188. Ask them to answer the questions. Have a discussion to conclude the lesson.

Fun with Maths!

Materials required: -

Objective of the activity: Collecting information and presenting the information in a multiple bar graph

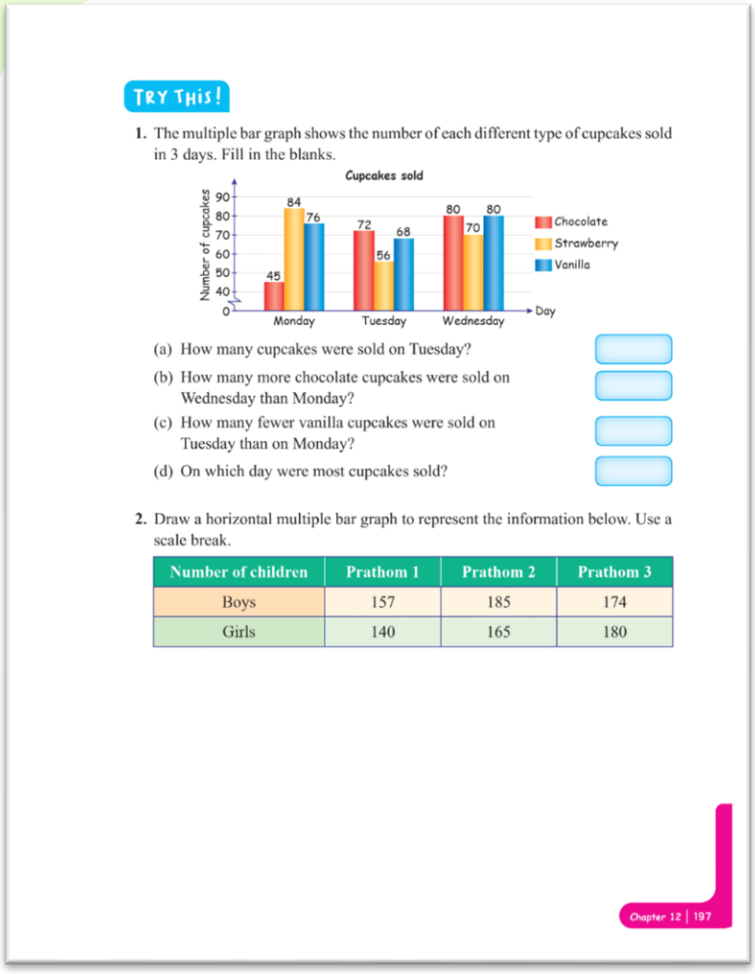
With this activity, the students will have the first-hand experience to collect the data and present it in a graph.

Try This!

Get 5 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 167 to 175 in Go Get Maths Workbook P5.



TRY THIS!

1. The multiple bar graph shows the number of each different type of cupcakes sold in 3 days. Fill in the blanks.

(a) How many cupcakes were sold on Tuesday?

(b) How many more chocolate cupcakes were sold on Wednesday than Monday?

(c) How many fewer vanilla cupcakes were sold on Tuesday than on Monday?

(d) On which day were most cupcakes sold?

2. Draw a horizontal multiple bar graph to represent the information below. Use a scale break.

Number of children	Prathom 1	Prathom 2	Prathom 3
Boys	157	185	174
Girls	140	165	180

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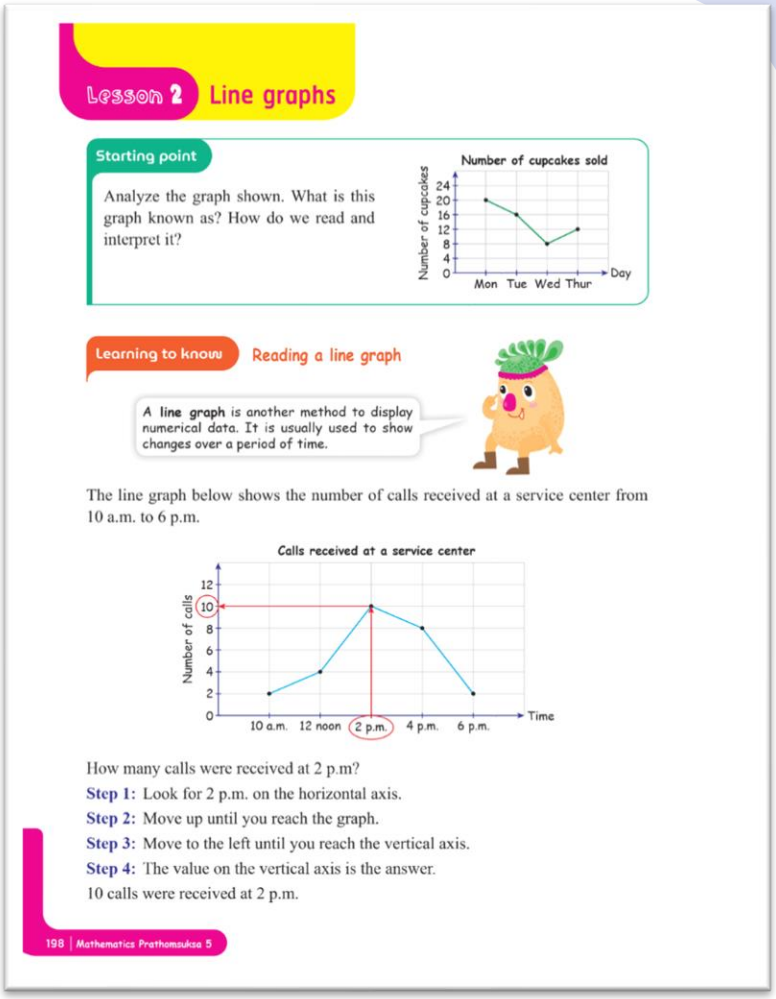

Lesson 2 Line graphs

Starting point

Analyze the graph shown. What is this graph known as? How do we read and interpret it?

Learning to know Reading a line graph

A **line graph** is another method to display numerical data. It is usually used to show changes over a period of time.

The line graph below shows the number of calls received at a service center from 10 a.m. to 6 p.m.

How many calls were received at 2 p.m?

Step 1: Look for 2 p.m. on the horizontal axis.

Step 2: Move up until you reach the graph.

Step 3: Move to the left until you reach the vertical axis.

Step 4: The value on the vertical axis is the answer.

10 calls were received at 2 p.m.

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or visit
http://tiny.cc/h0qsuz

Lesson 2
Line graphs

Lesson objectives

By the end of the lesson, the students should be able to:

1. Read a line graph.

Suggested teaching time

4 periods (4 x 50 minutes)

Vocabulary

Line graph

Materials needed

-

Starting point

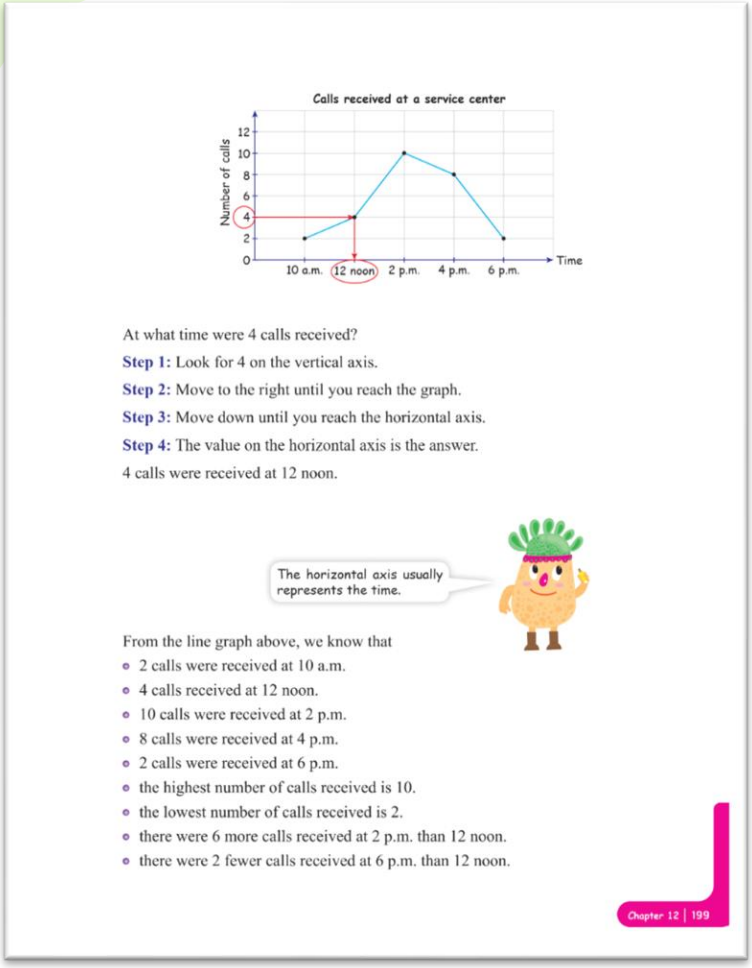
Help the students to understand the questions. Ask them if they know the answers and what they will learn today.

Teaching ideas

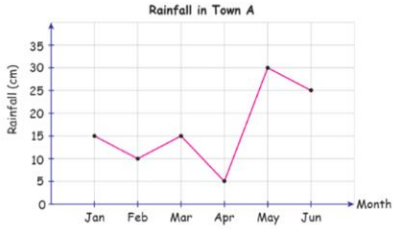
1. Inform the students that line graphs are another type of data representation that shows the changes over a period of time.
2. Ask them to analyze the graph. Ask them these questions to start a discussion:
   a) What is this graph about?
   b) What are the axes representing?
3. Guide them to read the graph step by step. They can find the number of calls received at 2 pm by sliding vertically from 2 pm until the graph and then sliding horizontally to reach the value.
4. Ask them to take note that the x-axis usually represents the time. The time can be in hours, days, months or even years.

Teaching ideas

5. Tell them that they can find the time when 4 calls were received by sliding horizontally from 4 calls until the graph and then sliding vertically to reach the time.
6. Guide them to extract other information from the line graph.



The line graph below shows the rainfall recorded in Town A from January to June in a certain year.



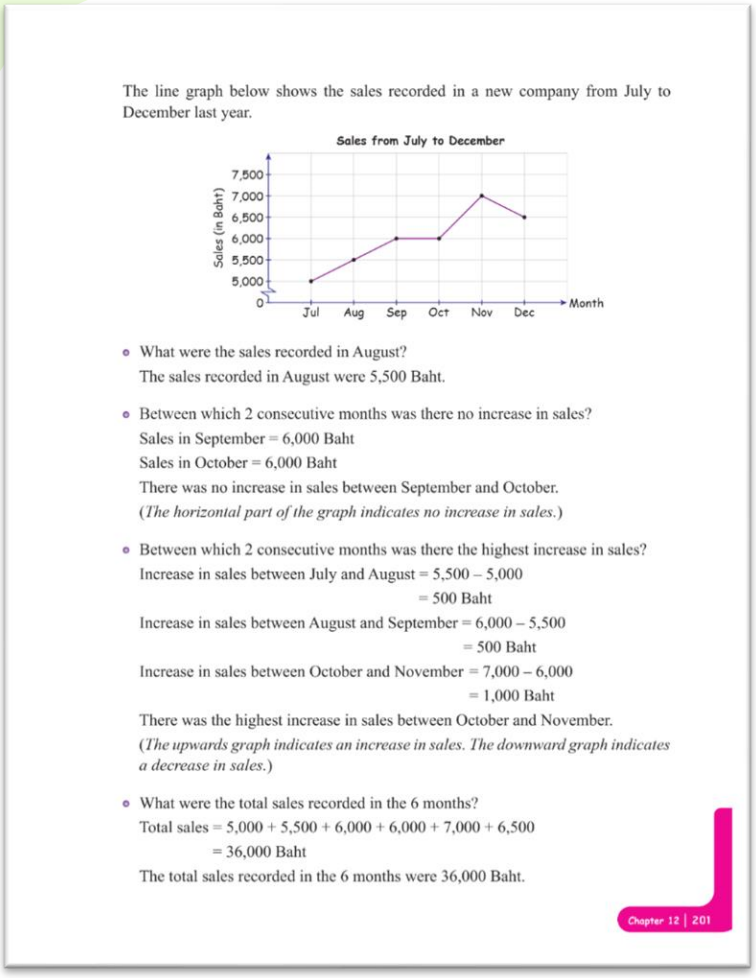
- How much rainfall is recorded in March?
  15 cm of rainfall is recorded in March.
- Which month is the wettest? Explain.
  May is the wettest month. It recorded the highest rainfall.
- Which month is the driest? Explain.
  April is the driest month. It recorded the lowest rainfall.
- What is the total rainfall recorded in May and June?
  Rainfall in May = 30 cm
  Rainfall in June = 25 cm
  Rainfall in May and June = 30 + 25
  = 55 cm
  The total rainfall recorded in May and June is 55 cm.
- What is the increase in rainfall between February and March?
  Rainfall in February = 10 cm
  Rainfall in March = 15 cm
  Difference in rainfall between February and March = 10 – 15
  = 5 cm
  The increase in rainfall between February and March is 5 cm.

Teaching ideas

7. Work with them on the graph.
8. Ask them these extra questions to gage their understanding:
   a) How much rainfall is recorded in February?
   b) What is the decrease in rainfall between March and April?
   c) What is the increase in rainfall between April and May?
   d) What is the total rainfall recorded for the 6 months?

Teaching ideas

9. Work with them on the graph.
10. Ask them these extra questions to gage their understanding:
    a) What were the sales recorded in September?
    b) What was the increase in sales between July and September?
    c) Between which 2 months was there a decrease in sales? How much was it?
    d) What were the total sales recorded from September to December?
11. Guide the students to refer to **Starting Point** on page 198. Ask them to answer the questions. Have a discussion to conclude the lesson.



The line graph below shows the sales recorded in a new company from July to December last year.

- What were the sales recorded in August?
  The sales recorded in August were 5,500 Baht.
- Between which 2 consecutive months was there no increase in sales?
  Sales in September = 6,000 Baht
  Sales in October = 6,000 Baht
  There was no increase in sales between September and October.
  (*The horizontal part of the graph indicates no increase in sales.*)
- Between which 2 consecutive months was there the highest increase in sales?
  Increase in sales between July and August = 5,500 – 5,000
  = 500 Baht
  Increase in sales between August and September = 6,000 – 5,500
  = 500 Baht
  Increase in sales between October and November = 7,000 – 6,000
  = 1,000 Baht
  There was the highest increase in sales between October and November.
  (*The upwards graph indicates an increase in sales. The downward graph indicates a decrease in sales.*)
- What were the total sales recorded in the 6 months?
  Total sales = 5,000 + 5,500 + 6,000 + 6,000 + 7,000 + 6,500
  = 36,000 Baht
  The total sales recorded in the 6 months were 36,000 Baht.

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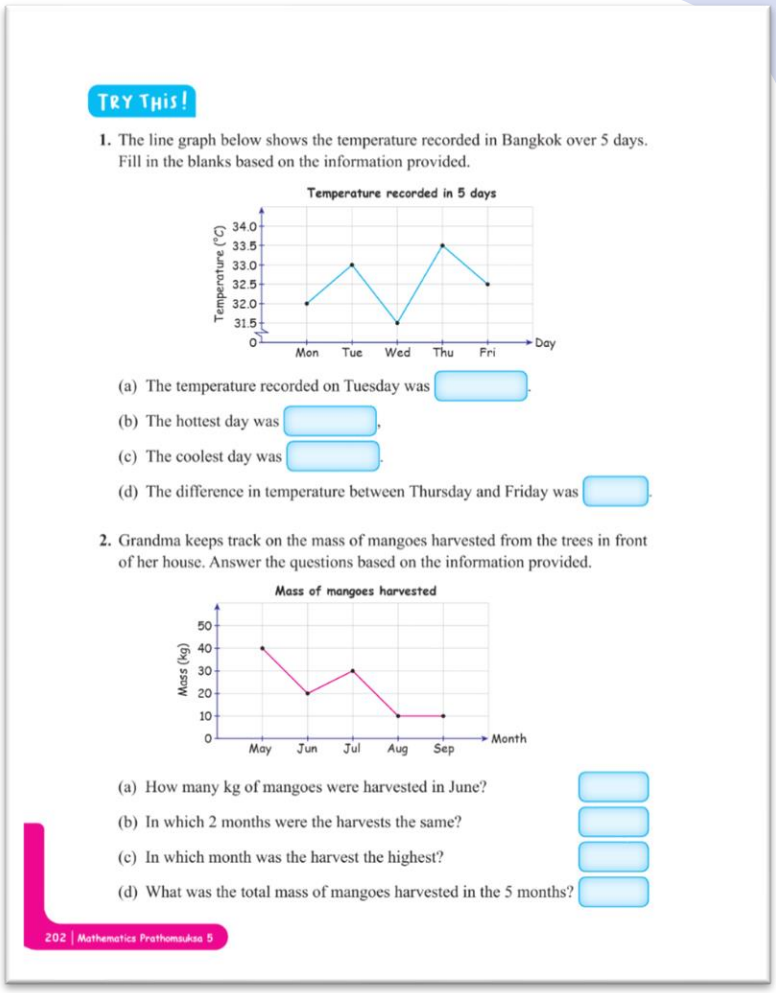


TRY THIS!

1. The line graph below shows the temperature recorded in Bangkok over 5 days. Fill in the blanks based on the information provided.

(a) The temperature recorded on Tuesday was _____.

(b) The hottest day was _____.

(c) The coolest day was _____.

(d) The difference in temperature between Thursday and Friday was _____.

2. Grandma keeps track on the mass of mangoes harvested from the trees in front of her house. Answer the questions based on the information provided.

(a) How many kg of mangoes were harvested in June? _____

(b) In which 2 months were the harvests the same? _____

(c) In which month was the harvest the highest? _____

(d) What was the total mass of mangoes harvested in the 5 months? _____

Try This!

Get 8 students to answer it. Ask the rest to verify the answers.

Further practices

Get the students to complete the practices on pages 176 to 179 in Go Get Maths Workbook P5.

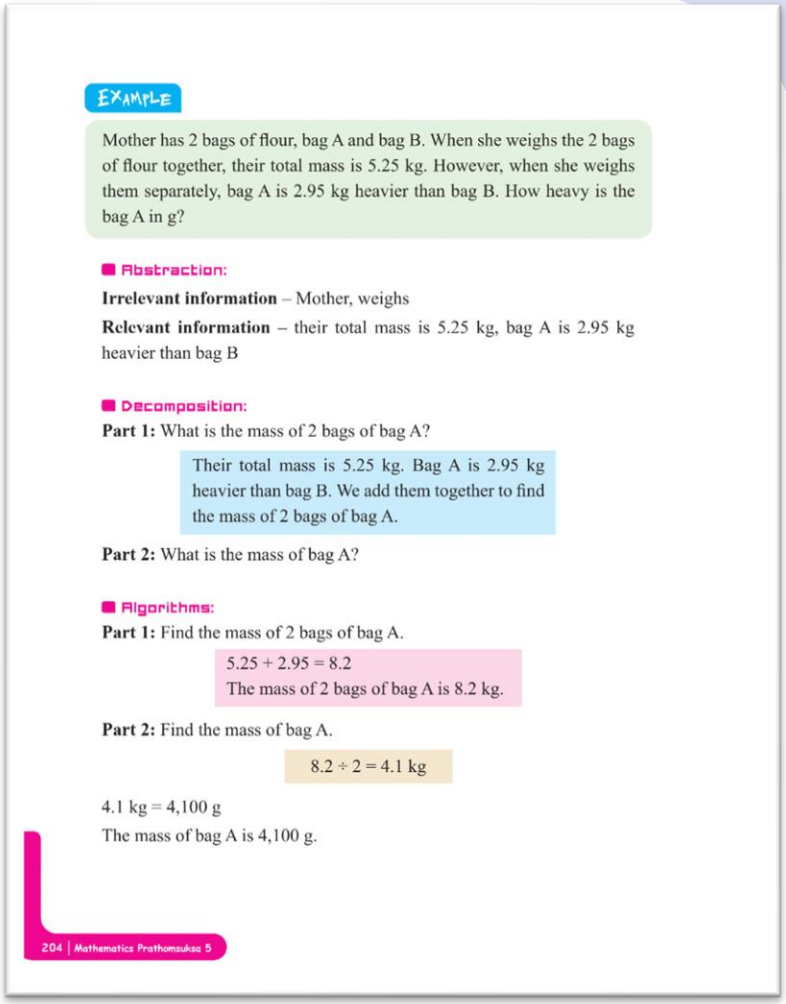
To find out if the students have mastered the second half of the year's content, ask them to complete the **Revision 2** on pages 180 to 190 in Go Get Maths Workbook P5.

Computational Thinking

The big idea

1. Tell the students that computational thinking is a way to solve a problem through a set of systematic approaches.
2. Explain briefly the 4 skills in computational thinking.
3. Give examples of how each skill is used.

- **Decomposition:** For example, to tidy up your room, you need break this task into smaller tasks like making your bed, tidying your table, organizing your clothes, sweeping the floor and more.
- **Pattern recognition:** For example, to tidy up your table, you may realize you need to sort out your books according their genres.
- **Algorithms:** For example, to tidy up your room, you need to plan which task to do first and which task follows. Should you mop the floor first and then sweep the floor?
- **Abstraction:** For example, when you are tasked to tidy up your room, you should ignore what online games your siblings are playing.



EXAMPLE

Mother has 2 bags of flour, bag A and bag B. When she weighs the 2 bags of flour together, their total mass is 5.25 kg. However, when she weighs them separately, bag A is 2.95 kg heavier than bag B. How heavy is the bag A in g?

Abstraction:

Irrelevant information – Mother, weighs

Relevant information – their total mass is 5.25 kg, bag A is 2.95 kg heavier than bag B

Decomposition:

Part 1: What is the mass of 2 bags of bag A?

Their total mass is 5.25 kg. Bag A is 2.95 kg heavier than bag B. We add them together to find the mass of 2 bags of bag A.

Part 2: What is the mass of bag A?

Algorithms:

Part 1: Find the mass of 2 bags of bag A.

5.25 + 2.95 = 8.2
The mass of 2 bags of bag A is 8.2 kg.

Part 2: Find the mass of bag A.

8.2 ÷ 2 = 4.1 kg

4.1 kg = 4,100 g
The mass of bag A is 4,100 g.

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Example

1. Guide the students to read and understand the question.
2. In this example, all the 3 skills are used – abstraction, decomposition and algorithms.
3. Some problems may require 1 or 2 skills. Some may require all the 4 skills.