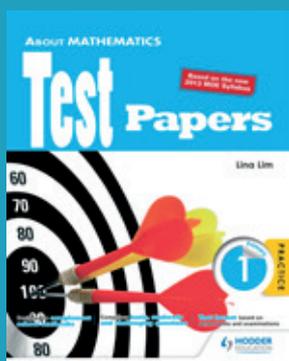
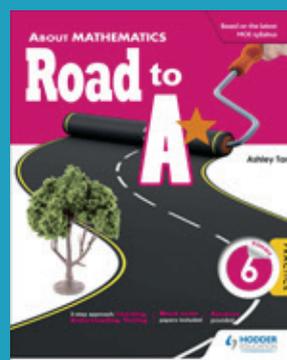
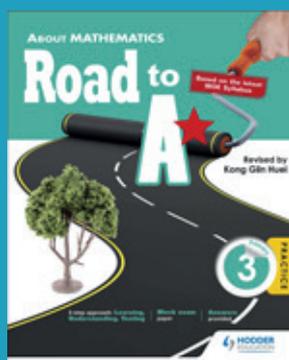
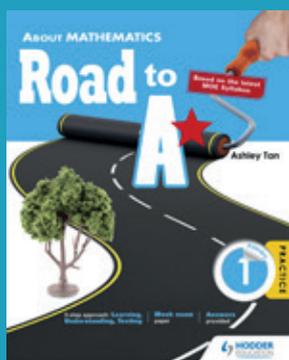
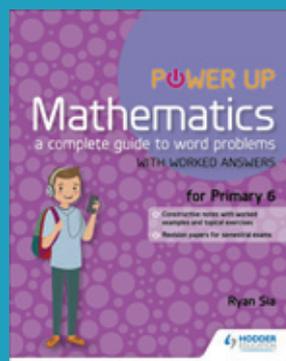
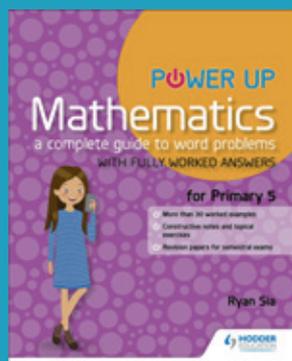


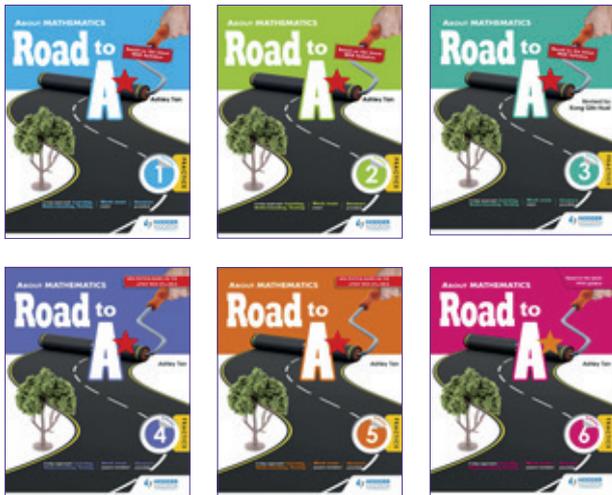
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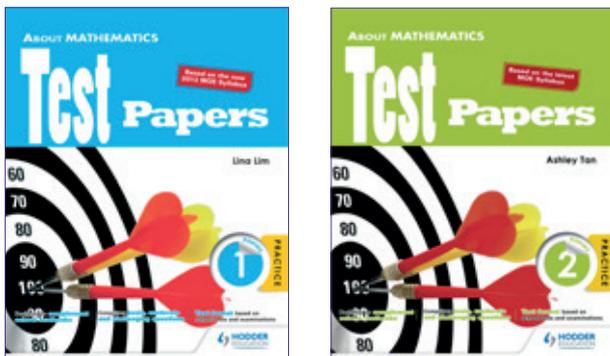
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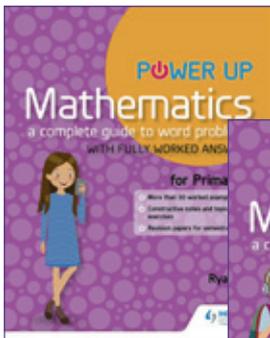
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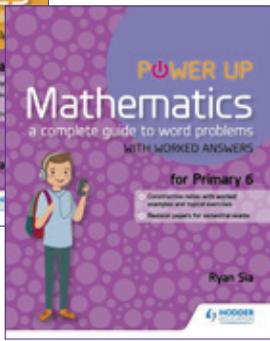
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## 2 FRACTIONS

**Learning Objectives:**

- Finding the number of objects in the fraction of a set
- Solving word problems with fractions involving addition, subtraction and multiplication

**2.1 Finding the number of objects in the fraction of a set**

**WORKED EXAMPLE 1**

There are 20 coloured balls in a box.  $\frac{2}{5}$  of them are red and the rest are green. How many coloured balls are green?

**Solution**

20 coloured balls

5 units  $\rightarrow$  20  
1 unit  $\rightarrow$  20  $\div$  5  
 $\rightarrow$  4  
3 units  $\rightarrow$  3  $\times$  4  
 $\rightarrow$  12

or

$\frac{3}{5} \times 20 = 12$

12 coloured balls are green.

**Note:** We can choose to reduce the fraction through the cancellation method or use model drawing to solve questions on fractions of a set. In this question, the 5 units will represent 20 coloured balls.

**2.2 Solving word problems with fractions involving addition, subtraction and multiplication**

Rules of addition and subtraction of fractions:

1. Change both fractions into similar denominators before adding or subtracting
2. When changing to equivalent fractions, the same number must be multiplied to both the numerator and denominator.

**WORKED EXAMPLE 2**

Jack had some balloons.  $\frac{1}{3}$  of the balloons were green and  $\frac{1}{4}$  of the balloons were yellow. The rest were red balloons. If Jack had 72 balloons altogether, how many red balloons did he have?

**Solution**

$$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

$$1 - \frac{7}{12} = \frac{5}{12}$$

$$\frac{5}{12} \times 72 = 30$$

or

$$\frac{1}{3} \times 72 = 24$$

$$\frac{1}{4} \times 72 = 18$$

$$72 - 24 - 18 = 30$$

He had 30 red balloons.

## Taken from Power Up Mathematics A Complete Guide to Word Problems Primary 5

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## 2 PERCENTAGE

**Learning Objectives:**

- Finding whole from a given part or percentage
- Finding percentage increase and percentage decrease

**2.1 Finding whole from a given part or percentage**

The percentage of a total quantity is always proportional to 100%. By using percentages to proportionally represent the given quantity, required quantity in the questions can be calculated.

**WORKED EXAMPLE 1**

There were 18 girls and 12 boys of a museum. Express the number of girls as a percentage of the total number of children at the museum.

**Solution**

$$18 \div 12 = 30$$

$$\frac{18}{12} = \frac{30}{100}$$

$$\rightarrow \frac{3}{10}$$

$$\frac{3}{10} \times 100\% = 60\%$$

60% of the total number of children at the museum are girls.

**Note:** When we calculate percentage, we always form the fraction first based on the given set by the question before multiplying 100% to the fraction. We can reduce the fraction to its lowest term before we proceed to multiply the percentage.

**WORKED EXAMPLE 2**

40% of the people in the library are adults. If there are 100 adults in the library, how many people are there altogether?

**Solution**

$$40\% \rightarrow 100$$

$$1\% \rightarrow 100 \div 40$$

$$\rightarrow 2.5$$

$$100\% \rightarrow 2.5 \times 100$$

$$\rightarrow 250$$

There are 250 people in the library altogether.

**Note:** The total quantity of any items, people or objects given in the question is equal to 100%. When we compare percentage and quantity, we can form mathematical equations by using the percentage units and quantity to solve challenging word problems.

**2.2 Finding percentage increase and percentage decrease**

We can also calculate the percentage increase or decrease by finding the values of the given percentages in the question. Discount means that the cost of the product becomes cheaper. Having a percentage more than 100% will mean that the amount has increased.

**WORKED EXAMPLE 1**

Gabriel wanted to buy a t-shirt which cost \$18. There was a 20% discount sale storewide. How much did he pay after the discount?

**Solution**

<b>Method 1</b>	<b>Method 2</b>
100% $\rightarrow$ 80%	100% $\rightarrow$ \$18
100% $\rightarrow$ \$18	20% $\rightarrow$ \$18 $\div$ 5
80% $\rightarrow$ \$18 $\times$ 80	$\rightarrow$ \$3.60
$\rightarrow$ \$14.40	\$18 - \$3.60 = \$14.40
He paid \$14.40.	He paid \$14.40.

**Note:** When we calculate percentage, we can also form quick calculation by finding the proportion of the percentage. Notice that 20% is  $\frac{1}{5}$  of 100%? We can then divide the quantity by 5 so that we can find the answer. (\$18  $\div$  5 = \$3.60)

**WORKED EXAMPLE 2**

The selling price of a car was \$80 000 last year. This year, it costs \$92 000. Find the percentage increase of the selling price of car?

**Solution**

$$\frac{\$92\,000 - \$80\,000}{\$80\,000} = \frac{\$12\,000}{\$80\,000}$$

$$12\,000 \div 80\,000 = 15\%$$

The percentage increase was 15%.

**Note:** To find the percentage increase and decrease, increase or decrease  $\frac{\text{change}}{\text{total or original amount}}$   $\times$  100%. When we calculate percentage, we need to find the difference in quantity before using it to form a fraction of the original amount to find the percentage.

## Taken from Power Up Mathematics A Complete Guide to Word Problems Primary 6

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