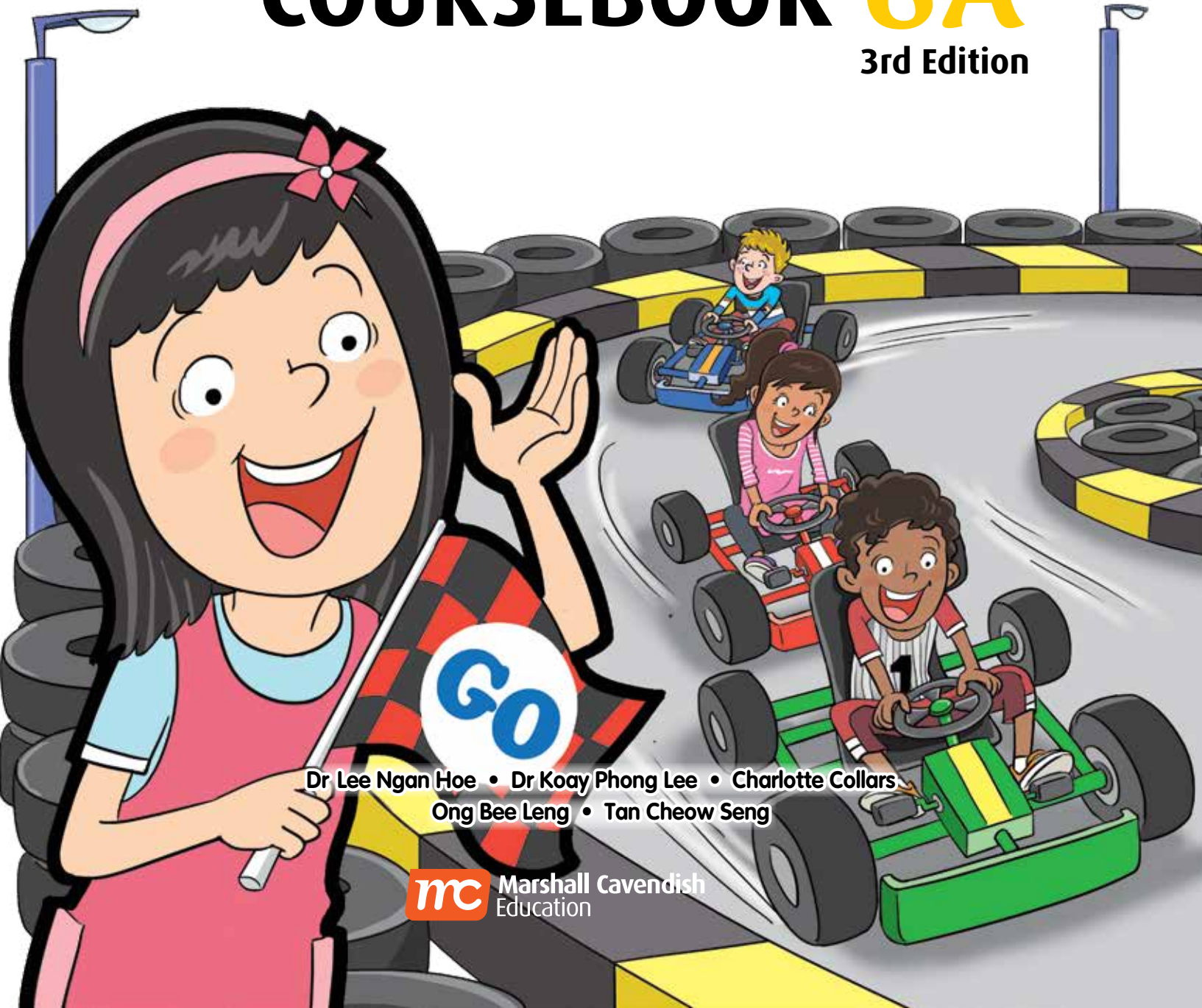


# Shaping Maths

## COURSEBOOK 6A

3rd Edition



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Marshall Cavendish  
Education

# Preface

**Shaping Maths (3rd Edition)** is an instructional package written according to the 2013 Ministry of Education, Singapore, primary mathematics syllabus. The package is designed to meet the learning needs of pupils from Primary 1 to 6. The Primary 6 package consists of two Coursebooks, two Activity Books and two Teacher's Planning Guides.

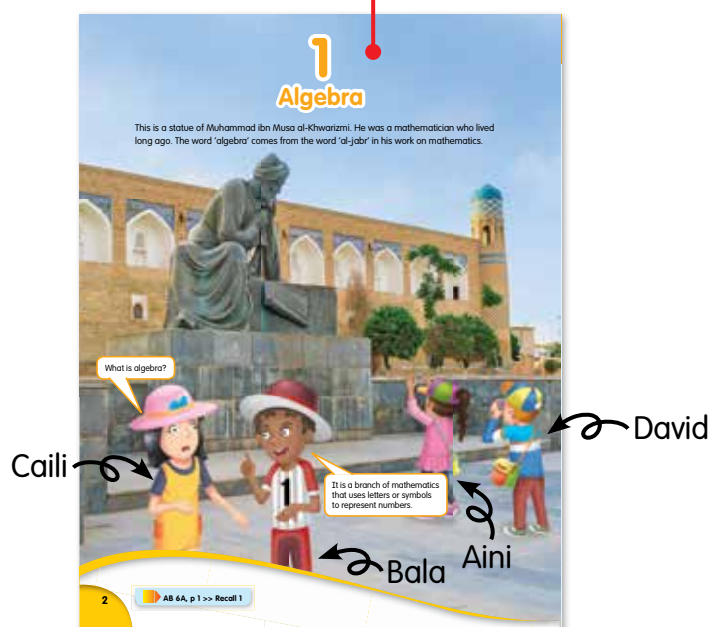
## Approach

**Shaping Maths (3rd Edition)** adopts a thematic approach towards the learning of mathematics in the upper primary levels. These themes reflect various aspects of pupils' lives and help provide a concrete framework for the mathematical concepts that pupils learn in class. Pupils' learning is then reinforced through the use of pictures and icons before they are introduced to the formal symbolic mode of mathematical representation. The themes also provide an environment for pupils to experience the interdisciplinary nature of learning.

Continuing research in education has resulted in the introduction of new features in the third edition. Through these features, educators are further equipped with various strategies in addressing teaching and learning needs. These features include hands-on activities, group/pair work and open-ended questions to encourage exploration and in-depth thinking among pupils. This will equip pupils well for the challenges of the 21<sup>st</sup> century.

## Features

**Colourfully illustrated unit openers** encourage rich and active pupil participation in learning and connections to everyday life through whole class discussion.



## Friends of Shaping Maths

The themes of the Coursebook revolve around Aini, Bala, Caili and David. The characters stimulate pupils' interest and heighten their involvement in the learning process.

**Question classification** helps teachers spend their time more effectively by using the appropriate questions to get pupils to master the necessary skills.



Reinforcement of current concepts



Higher-order thinking skills/enrichment

**App It!** helps pupils master concepts learnt through engaging and interactive applets.

**Fun with Maths**

Game for 3 players

What you need: two dice, calculator, counters of one colour for each player, game board

### Percent Jeopardy

In the game of Percent Jeopardy, the answer is the clue and the players have to provide the questions.

**My Notes**

Percentage discount =  $\frac{\text{Discount}}{\text{Price before the discount}} \times 100\%$

**Finding the Whole When a Percentage Is Known**

Example: Bala saved 40% of his pocket money and spent the remaining \$150. How much was his pocket money?

100% - 40% = 60%

60% → \$150

1% → \$2.50

100% → \$250

His pocket money was \$250.

**Change in Percentage**

Percentage decrease =  $\frac{\text{Amount decreased}}{\text{Quantity at first}} \times 100\%$

Percentage increase =  $\frac{\text{Amount increased}}{\text{Quantity at first}} \times 100\%$

Unit 3: Percentage

AB 6A, p 84 >> My Maths Journal

**Fun with Maths** engages pupils in interactive maths activities that encourage exploration, discovery and active thinking.

**My Notes** helps pupils consolidate and recall, and commit to memory key learning concepts.

**Guiding questions** build the habit of checking to understand a problem.

16 A box contained some ribbons. 35% of the ribbons were red, 40 ribbons were yellow and the rest were blue. There were 10 more blue ribbons than yellow ribbons.

a) How many ribbons were there in the box?

b) 15 ribbons in the box were torn. What percentage of the ribbons were not torn?

AB 6A, p 77 >> Activity 7

17 David and Bala share a packet of trading cards. David receives 70 trading cards. After David gives Bala 24 trading cards, the number of trading cards Bala has increases by 60%. How many trading cards are there in the packet?

David: 70  
Bala: 24  
Total: 94  
Then: 94 - 24 = 70  
Bala: 24 + 24 = 48  
Total: 70 + 48 = 118

18 Divide: Express each answer as a fraction or mixed number in its simplest form.

a)  $\frac{3}{4} \div \frac{1}{2}$  b)  $\frac{2}{3} \div \frac{1}{4}$   
c)  $\frac{4}{5} \div \frac{2}{3}$  d)  $\frac{5}{6} \div \frac{1}{2}$   
e)  $\frac{9}{11} \div \frac{3}{4}$  f)  $\frac{8}{9} \div \frac{4}{12}$   
g)  $\frac{11}{12} \div \frac{3}{4}$  h)  $\frac{2}{5} \div \frac{4}{10}$

App It! www.mindspiration.com/igntudentapplet

8 A faulty clock loses  $\frac{1}{2}$  min every hour. How many hours will it take to lose  $\frac{1}{2}$  hr?

9 Linda needs  $\frac{1}{3}$  h to sew a pillowcase. How many such pillowcases can she sew in  $\frac{2}{3}$  h?

10 A robot walks  $\frac{5}{8}$  km in an hour. How long does it take to walk  $\frac{1}{12}$  km?

11 The area of a rectangle is  $\frac{4}{5} \text{ m}^2$ . Its breadth is  $\frac{2}{3} \text{ m}$ . Find its length.

AB 6A, p 83 >> Activity 3

Unit 2: Fractions

8 In the figure, KSTW is a trapezium and TUV is an isosceles triangle.  $WR \parallel TS$  and  $TU = TV$ . RTU and STV are straight lines.  $\angle RWT = 54^\circ$  and  $\angle RTW = 52^\circ$ . Find  $\angle TVU$ .

Which angle in triangle TUV can help me find  $\angle TVU$ ?  
How can I get this other angle from the two given angles?

9 In the figure, SWV is an equilateral triangle and STUV is a trapezium.  $ST \parallel VU$ ,  $\angle TSU = 24^\circ$  and WVU is a straight line. Find  $\angle VSU$ .

$\angle VSU$  is part of the angles between parallel lines. How can I find the missing angles between parallel lines?

I can use another method to check my answer.

Unit 6: Angles in Geometrical Figures

**Activity 1**

Decide whether the price of each item has increased or decreased and by how much. Then find the percentage change in price.

Item	Original price	New price	Amount of change	Percentage change in price
a) Shirt	\$80	\$92	Increased by \$12	15%
b) Blouse	\$35	\$42		
c) Tie	\$24	\$18		

Explain how you find the percentage change in price.

**Activity 2**

A number increased by 63. The original number was 180. Express this increase as a percentage of the original number.

**Activity 3**

The usual price of a bag was \$256. Miss Tan paid \$38.40 less for the bag after the discount. What was the percentage discount?

**Activity 4**

Last year, Primary 1 enrolment in a school was 180. Enrolment in the same school this year is 234. Find the percentage increase in enrolment.

180 → 234

180 → 234

180 → 234

Increase in enrolment =  $234 - 180 = 54$

Percentage increase =  $\frac{54}{180} \times 100\% = 30\%$

The percentage increase in enrolment is 30%.

Unit 3: Percentage

AB 6A, p 84 >> My Maths Journal

**NEW!**

**Activities** have been included to provide more individual, pair and group hands-on learning. These, along with the manipulatives required, are highlighted for ease of use.

**Review and Revision**

provide a formative assessment of pupils' understanding and help to consolidate learning.

**Review C**

1 The radius of a circular coaster is 8 cm. What is its diameter?

2 The diameter of a circular picture frame is 56 cm. What is its radius?

3 Find the circumference of each circle.

**Revision**

**Part A**

For each question, four options are given. One of them is the correct answer.

1 What is the value of the digit 6 in 460 0357?

(1) 60 (2) 600 (3) 6000 (4) 60 000

2 What is the missing number in the number pattern?

8132, 8432, 8732, 9032, 9332

(1) 9132 (2) 9232 (3) 9332 (4) 9432

3 Round 5239 425 to the nearest 5000.

(1) 5200 000 (2) 5230 000 (3) 5239 000 (4) 5240 000

4 Find the value of  $\frac{2}{3} \div \frac{1}{4}$ .

(1)  $\frac{8}{15}$  (2)  $\frac{2}{3}$  (3)  $\frac{1}{4}$  (4)  $\frac{26}{35}$

5 Which of the dotted lines is not a line of symmetry?

(1) (2) (3) (4)

Unit 2: Fractions

Unit 6: Angles in Geometrical Figures

Unit 3: Percentage

Unit 4: Area and Perimeter

Unit 5: Volume and Capacity

Unit 6: Angles in Geometrical Figures

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Unit 8: Decimals

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Unit 10: Problem Solving



Sections with this icon involve the use of calculators.

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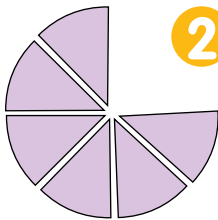
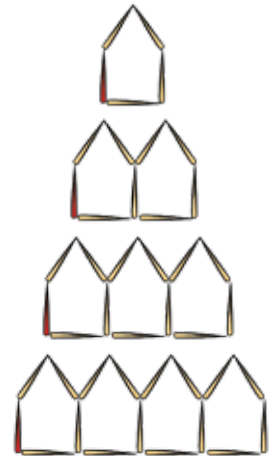
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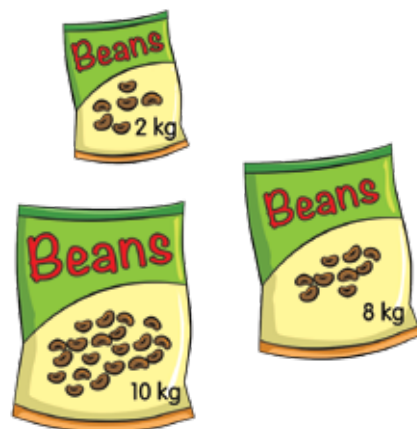
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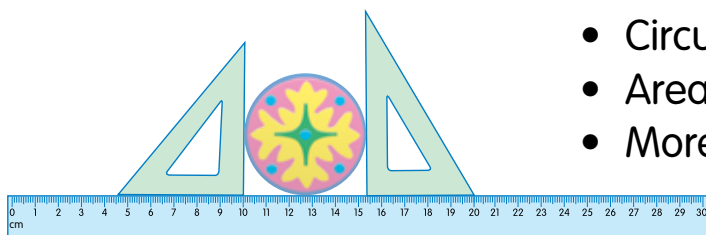
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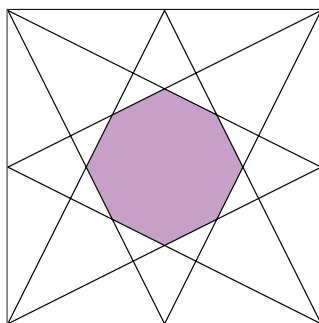


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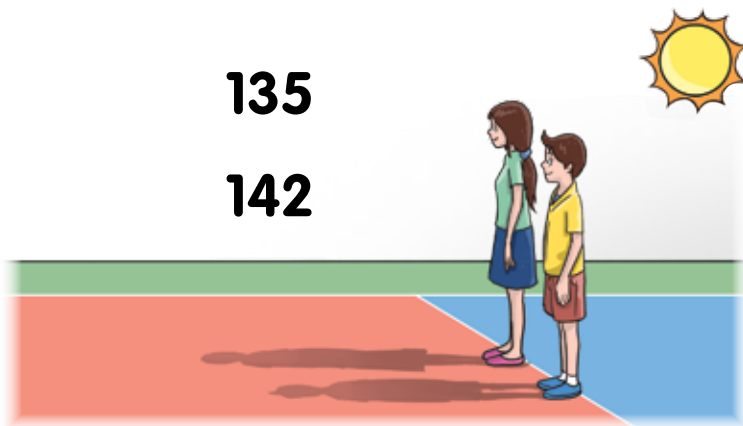


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135

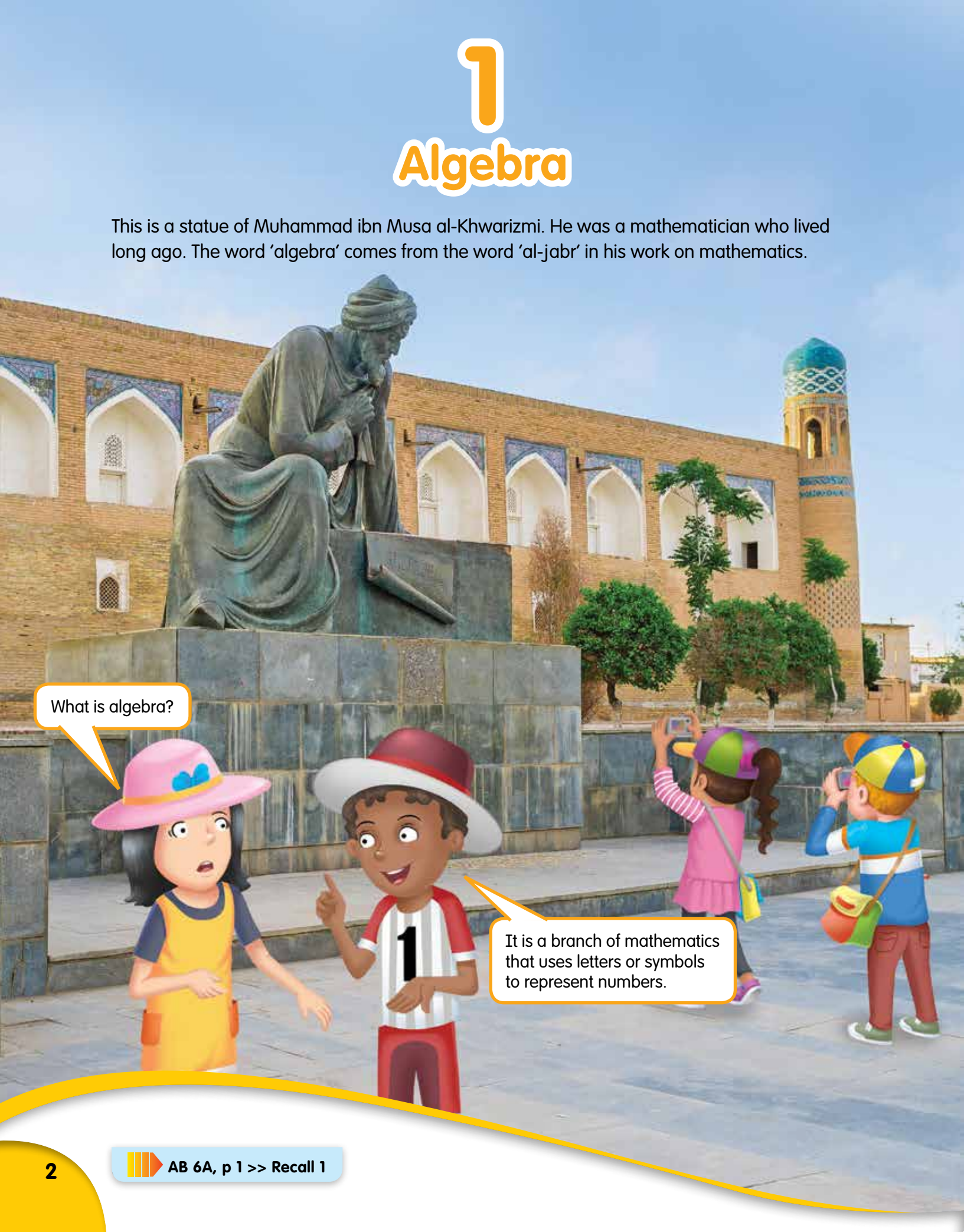
## Revision

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# 1 Algebra

This is a statue of Muhammad ibn Musa al-Khwarizmi. He was a mathematician who lived long ago. The word 'algebra' comes from the word 'al-jabr' in his work on mathematics.



What is algebra?

It is a branch of mathematics that uses letters or symbols to represent numbers.

# Algebraic Expressions

Aini's mother is 23 years older than Aini.



When Aini was 1 year old,  
her mother was 24 years old.



Aini is 12 years old now.  
Her mother is 35 years old.



When Aini was 7 years old,  
her mother was 30 years old.

Use the information above to find the missing numbers in the table.

Aini's age (years)	Her mother's age (years)
1	24
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Aini's mother is always  
23 years older than Aini.



When Aini was  years old, her mother was  years old.

We can use a letter to represent the unknown number.

When Aini is  $x$  years old, her mother is  $(x + 23)$  or  $(23 + x)$  years old.

$(x + 23)$  and  $(23 + x)$  are **algebraic expressions** in terms of  $x$ .



1

How much pocket money does David's brother get?



David

Our father gives us pocket money every week.



David's brother

I get \$2 less than David.

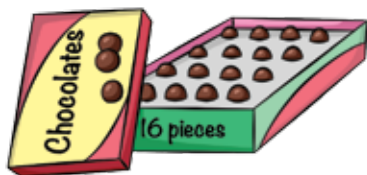
When David gets \$15, his brother gets \$13.

a) When David gets \$18, his brother gets \$ .

b) When David gets \$ $y$ , his brother gets \$ .

2

Find the missing numbers.



We write  $16 \times p$  as  $16p$ .  
 $16p$  is an algebraic expression in terms of  $p$ .

There are 16 pieces of chocolate in a box.

a) There are  pieces of chocolate in 3 boxes.

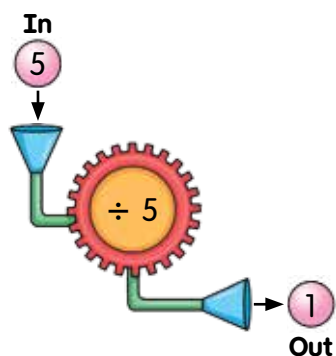
b) There are  pieces of chocolate in 8 boxes.

c) There are  pieces of chocolate in  $p$  boxes.



3

Use the machine to find the missing numbers and letters in the table.



In	Out
5	1
10	2
15	<input type="text"/>
$a$	<input type="text"/>

We write  $a \div 5$  as  $\frac{a}{5}$ .







What will you get when you put  $b$  in the machine?



4

The table below shows the number of toothpicks used to make figures of houses.

a) Count the number of toothpicks used to make the houses.

Figure	Number of houses	Number of toothpicks used
	1	$1 + \text{ } = \text{ }$
	2	$1 + \text{ } = \text{ }$
	3	$1 + \text{ } = \text{ }$
	4	$1 + \text{ } = \text{ }$

Number of toothpicks used =  $1 + 4 \times \text{Number of houses}$

b) How many toothpicks do you need to make 10 houses?

c) How many toothpicks do you need to make  $n$  houses? Explain.



AB 6A, p 3 >> Activity 1

5

Find the missing numbers and expressions.

a) Caili is 12 years old.

i) 2 years ago, she was  years old.

$m$  years ago, she was  years old.

ii) In 4 years' time, she will be  years old.

In  $m$  years' time, she will be  years old.

b) Mary is  $n$  times as old as Caili.

i) Express Mary's age in terms of Caili's age.

ii) How old was Mary 5 years ago?