Australian

Signpost MATHS NSW

Sample pages

2

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What is Australian Signpost Maths NSW?

Australian Signpost Maths NSW is a mathematics activity book series for students from Kindergarten to Year 6. The series has been written to meet the requirements of the Australian Curriculum: Mathematics in NSW.

The components of the series include Student Books, Teacher's Books, Mentals Books and an interactive Website. Teachers can select an appropriate program for every student from the rich and varied material provided.

The content has been carefully sequenced within each year level and across the series to take into account students' likely mathematical development.

Student Books

Teacher's Books

Mentals Books

Website

Structure of Australian Signpost Maths NSW

Australian Signpost Maths NSW emphasises the curriculum's syllabus content as well as problem-solving strategies, language development and the use of technology.

To maximise the benefits of the program, the Student Book, Teacher's Book, Mentals Book and Website should be used together.

The sequence of units in the **Student Book** forms a suggested program for the year. The **Teacher's Book** also provides lesson plans for each page of the Student Book and blackline masters to assist teachers in implementing the program.

The Student Book presents lessons as a mix of content strands. However, the Contents and Syllabus Overview and Contents Cross-reference pages in the Student Book allow teachers to construct programs based on the specific content strands (Number and Algebra, Measurement and Geometry, and Statistics and Probability). Progress Tests and remediation records are located in the Teacher's Book and on the website. These tests are also now included in the back of this book.

Each **Mentals Book** for Years 1 to 6 mixes examples from all strands, reviewing the content of previous units of the Student Book.

The innovative **Website** helps teachers to bring mathematics alive with technology. The website provides interactive maths tools, games and practice opportunities as well as relevant resource masters and worksheets for all year levels. These can be used for whole-class, small-group and individual learning. The website also includes **Concept Check-In** a new diagnostic screener.

Special Features of Australian Signpost Maths NSW

- **Traffic Light** system allows students to reflect on their work and highlight any units that they are having trouble understanding. They tick the red for units they feel they still don't understand, and green for those they feel they understand fully.
- Exercises are **well graded**. New work is reinforced in the Mentals Book.
- The **Progress Tests** (now also in the back of this book) allow the teacher to discover each student's strengths and weaknesses, and the cross-references direct students to the pages where that work is introduced.
- **Concept Check-In** diagnostic screener (on the Website) provides a snapshot of the class' conceptual understandings to aid in classroom management. It also allows teachers to measure progress over time.
- **Answers** are supplied in the Teacher's Book.
- The **Dictionary** at the beginning of this Student Book will help students to learn the language of mathematics.
- **ID Cards** (in the Mentals Book, Teacher's Book and Website) review the language of mathematics by asking students to identify common terms, shapes and symbols.
- Important **rules and concepts** are clearly highlighted.
- **Worked examples** and explanations are given throughout the Student Book where new ideas are introduced.
- The use of **colour** makes emphasis clear and is highly motivating.
- **Cartoons** give instruction and friendly advice.
- **Interactive Activities** are provided on the website for whole-class, small-group and individual learning.

Australian Signpost Maths NSW Icons

Signpost icons are used throughout the book as cues to the essential nature of exercises and activities, and as a guide to ways of engaging with them. These icons often indicate alternative or more concrete approaches to dealing with concepts.

This icon highlights **important rules and concepts** occurring throughout the book. It often appears with worked examples.

Activities provide **applications and enrichment**. These activities usually involve the use of concrete materials and partner or group work.

These enjoyable activities are used to **motivate and involve** students in mathematical pursuits. They usually involve games and puzzles.

Investigations allow students to **explore and discover** maths concepts.

This icon indicates the use of computers, calculators or other **information and communications technology**.

Structure of NSW Mathematics K–6, Australian Curriculum

The K–6 Mathematics Syllabus content is described in Early Stage 1, Stage 1, Stage 2 and Stage 3. Students develop at different rates, but Stage 1 describes the content expected to be covered in Years 1 and 2.

The outcome reference MA1-4NA refers to Mathematics Stage 1, Substrand 4 in the Number and Algebra strand. Relevant syllabus outcomes are shown at the bottom of each Student Book page.

The Working Mathematically strand pervades each of the other strands.

The syllabus strands and substrands covered in Stage 1 are shown below.

- **Working Mathematically**
  - Communicating Problem Solving Reasoning Understanding Fluency MA1-1WM, MA1-2WM, MA1-3WM
- **Number and Algebra**
  - Whole Numbers MA1-4NA
  - Addition and Subtraction MA1-5NA
  - Multiplication and Division MA1-6NA
  - Fractions and Decimals MA1-7NA
  - Patterns and Algebra MA1-8NA
- **Measurement and Geometry**
  - Length MA1-9MG
  - Area MA1-10MG
  - Volume and Capacity MA1-11MG
  - Mass MA1-12MG
  - Time MA1-13MG
  - Three-Dimensional Space MA1-14MG
  - Two-Dimensional Space MA1-15MG
  - Position MA1-16MG
- **Statistics and Probability**
  - Data MA1-17SP
  - Chance MA1-18SP

2 Contents and Syllabus Overview

KEY

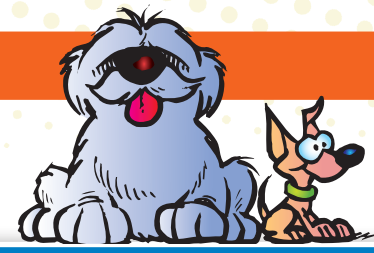
- Number and Algebra
- Measurement and Geometry
- Statistics and Probability

Working Mathematically pervades all of the strands as indicated by the 'WM' outcomes.

Page	Unit	Title	Strand	Substrand	Syllabus Outcomes	Suggested Progress
1		Thinking Skills				Term 1
2	1A	Addition Combinations to 10	Number and Algebra	Addition and Subtraction	MA1-1WM, -5NA, -8NA	
3	1B	Subtraction to 10	Number and Algebra	Addition and Subtraction	MA1-1WM, -5NA, -8NA	
4	1C	One Half	Number and Algebra	Fractions and Decimals	MA1-1WM, -7NA	
5	1D	2D Shapes	Measurement and Geometry	2D Space	MA1-1WM, -15MG	
6	2A	Ordinal Numbers	Number and Algebra	Whole Numbers	MA1-1WM, -2WM, -3WM, -4NA, -13MG	
7	2B	Position Words	Measurement and Geometry	Position	MA1-1WM, -16MG	
8	2C	Revision of Time	Measurement and Geometry	Time	MA1-1WM, -13MG	
9	2D	Ordering Capacities	Measurement and Geometry	Volume and Capacity	MA1-1WM, -2WM, -3WM, -11MG	
10	3A	Counting Patterns	Number and Algebra	Patterns and Algebra	MA1-1WM, -2WM, -3WM, -4NA, -8NA	
11	3B	Counting	Number and Algebra	Whole Numbers	MA1-1WM, -2WM, -3WM, -4NA, -8NA	
12	3C	One Quarter	Number and Algebra	Fractions and Decimals	MA1-1WM, -7NA	
13	3D	Describing 3D Objects	Measurement and Geometry	3D Space	MA1-1WM, -14MG	
14	4A	Addition to 20	Number and Algebra	Addition and Subtraction	MA1-1WM, -2WM, -3WM, -5NA	
15	4B	Addition to 20	Number and Algebra	Addition and Subtraction	MA1-1WM, -2WM, -3WM, -5NA	
16	4C	Comparing Masses	Measurement and Geometry	Mass	MA1-1WM, -2WM, -3WM, -12MG	
17	4D	Balance Scales	Measurement and Geometry	Mass	MA1-1WM, -2WM, -3WM, -12MG	
18	5A	Modelling Numbers	Number and Algebra	Whole Numbers	MA1-1WM, -2WM, -3WM, -4NA	
19	5B	Doubling and Near Doubling	Number and Algebra	Addition and Subtraction	MA1-1WM, -2WM, -3WM, -5NA	
20	5C	Informal Units of Length	Measurement and Geometry	Length	MA1-1WM, -9MG	
21	5D	Informal Units of Length	Measurement and Geometry	Length	MA1-1WM, -3WM, -9MG	
22	6A	Volume	Measurement and Geometry	Volume and Capacity	MA1-1WM, -2WM, -3WM, -11MG	
23	6B	Groups and Rows	Number and Algebra	Multiplication and Division	MA1-1WM, -2WM, -3WM, -6NA	
24	6C	Analog Time	Measurement and Geometry	Time	MA1-1WM, -2WM, -3WM, -13MG	T1*
25	6D	Analog Time	Measurement and Geometry	Time	MA1-1WM, -2WM, -3WM, -13MG	
26	7A	Sharing	Number and Algebra	Multiplication and Division	MA1-1WM, -2WM, -3WM, -6NA	
27	7B	Sharing	Number and Algebra	Multiplication and Division	MA1-1WM, -2WM, -3WM, -6NA	

*Suggested program for Progress Tests 1 to 4. (See Teacher's Book.)

Contents Cross-reference



Number and Algebra

		Pages
1	**Counting**	
	Counting to and from any starting point	10, 11, 18, 58, 59, 62
	Number sequences of twos, threes, fives and tens	10, 11, 18, 66, 75, 94, 95
2	**Whole numbers**	
	Numbers to 1 000	10, 11, 18, 34, 35, 58, 59, 62, 74, 100, 135
	Ordering numbers	10, 62, 78, 79, 100, 106, 135
	Rounding numbers	100, 135
	Place value: ones, tens and hundreds	18, 34, 35, 58, 59, 62, 74, 126, 127
	Partitioning and regrouping numbers	14, 15, 18, 31, 34, 35, 58, 59, 74, 86, 87, 102, 103, 114, 115, 127, 128, 129
	Ordinal numbers	6, 112
	Using a calculator	10, 11, 18, 102, 103, 126, 127, 128, 146, 147
3	**Addition and subtraction**	
	Addition problems	2, 14, 15, 19, 31, 43, 44, 50, 51, 53, 63, 66, 67, 72, 79, 86, 87, 90, 91, 94, 95, 102, 106, 114, 127, 128, 129
	Subtraction problems	3, 30, 42, 43, 44, 50, 51, 53, 67, 94, 103, 111, 115, 126, 128, 129, 147
	Mental and written strategies	2, 3, 14, 15, 19, 31, 43, 63, 66, 67, 72, 86, 87, 102, 103, 106, 114, 115, 126, 127, 128, 129, 147
	Connecting addition and subtraction	50, 51, 53, 67
	Problems involving a missing element	14, 15, 31, 44, 72
4	**Multiplication and division**	
	Multiplication and repeated addition	23, 38, 39, 44, 82, 83, 98, 99, 122, 140, 146
	Division and repeated subtraction	26, 27, 46, 47, 54, 55, 110, 111, 118, 119, 123, 140, 146
	Mental and written strategies	23, 27, 38, 39, 44, 47, 82, 83, 110, 111, 118, 119, 122, 123, 140
	Connecting multiplication and division	54, 55, 140
5	**Fractions**	
	Halves, quarters and eighths of shapes and everyday objects	4, 12, 48, 49, 64, 96
	Halves, quarters and eighths of collections	4, 32, 33, 48, 49, 65, 96
6	**Money**	
	Australian coins and notes	2, 78, 79, 90, 91, 95, 106
7	**Patterns and algebra**	
	Number patterns and their rules	10, 11, 62, 66, 67, 75, 94, 147
	Using number sentences to solve problems	14, 15, 19, 23, 30, 31, 39, 43, 44, 50, 51, 53, 63, 82, 83, 98, 99, 146

1A Addition Combinations to 10

CONCEPT

Emma has

Paul has

$3
+$5
$8

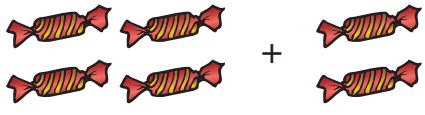
Altogether Emma and Paul have $8.

1 Count on from the largest number to complete these.

a 1 + 6 = ☐	**b** 2 + 2 = ☐	**c** 3 + 4 = ☐	**d** 1 + 3 = ☐	**e** 4 + 5 = ☐
f 4 + 4 = ☐	**g** 6 + 3 = ☐	**h** 5 + 4 = ☐	**i** 6 + 1 = ☐	**j** 0 + 5 = ☐
k 2 + 7 = ☐	**l** 5 + 1 = ☐	**m** 2 + 5 = ☐	**n** 3 + 6 = ☐	**o** 7 + 0 = ☐

Discuss word problems for these number sentences.

2 Finish the **number story** for each question below.

a  ☐ lollies + ☐ lollies equals ☐ lollies.

b  ☐ pears + ☐ pears equals ☐ pears.

Use objects to model your own addition stories.

ACTIVITY

1B Subtraction to 10

1 You could use counting on or counting back to complete these.

a 6 – 4 = ☐ **b** 8 – 3 = ☐ **c** 9 – 6 = ☐

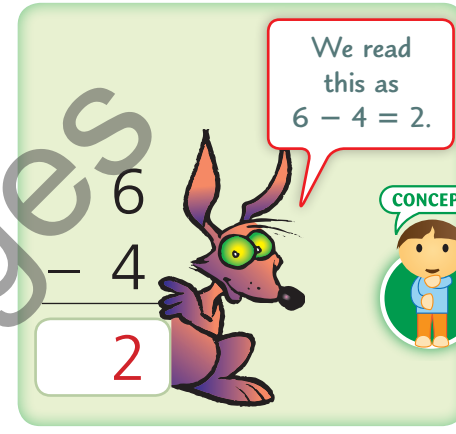
d 10 – 7 = ☐ **e** 9 – 5 = ☐ **f** 10 – 8 = ☐

g 7 – 4 = ☐ **h** 10 – 4 = ☐ **i** 9 – 3 = ☐

2 **a** 5 − 3 = ☐ **b** 7 − 1 = ☐ **c** 10 − 3 = ☐

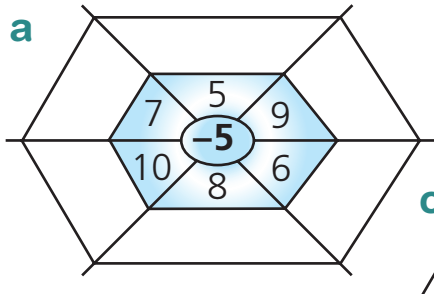
d 5 − 4 = ☐ **e** 6 − 3 = ☐ **f** 9 − 8 = ☐

g 9 − 4 = ☐ **h** 9 − 7 = ☐ **i** 10 − 6 = ☐ **j** 7 − 3 = ☐ **k** 8 − 5 = ☐

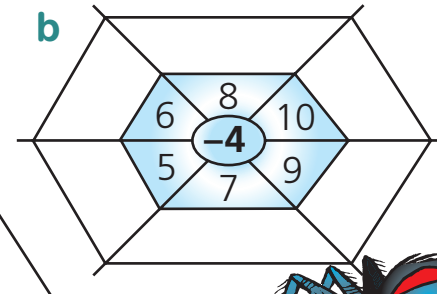


3 **a** 8 pegs − 4 pegs = ☐ **b** 8 bugs − 2 bugs = ☐ **c** 9 cats − 2 cats = ☐ **d** 10 bears − 5 bears = ☐

4 **a**



b



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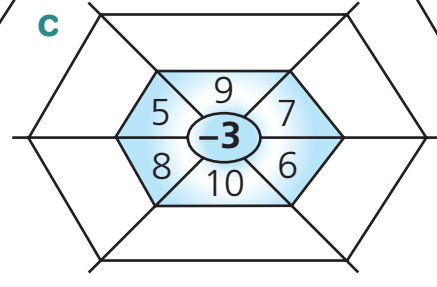
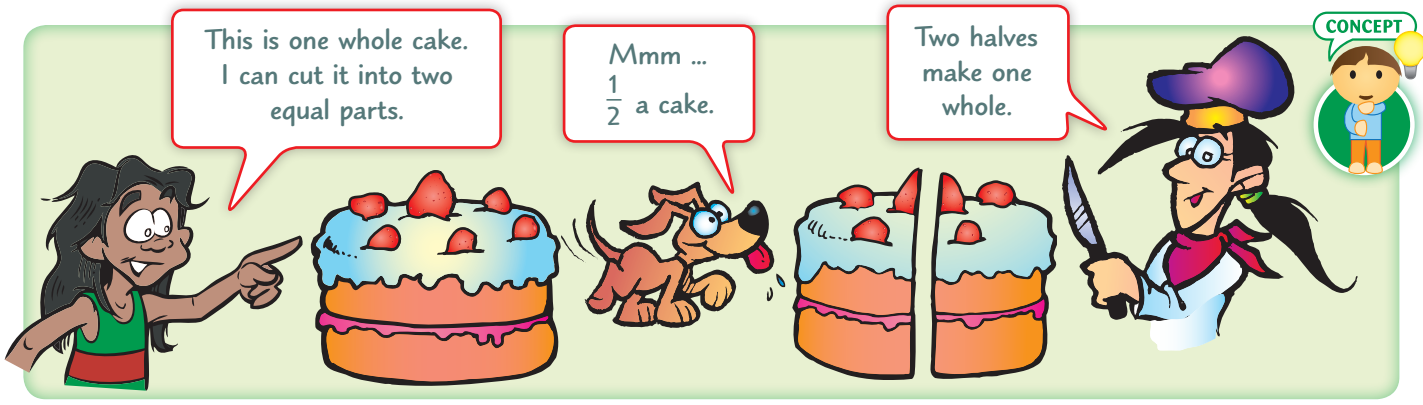
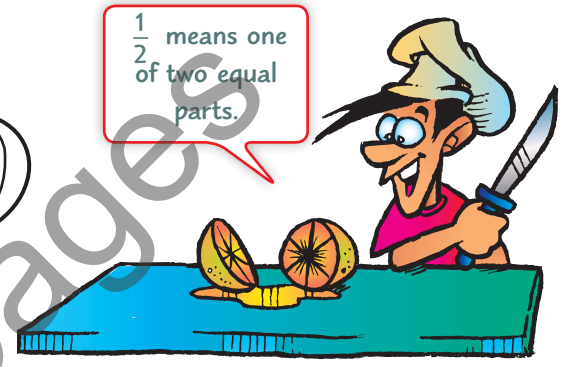


Discuss word problems for the number sentences on this page.

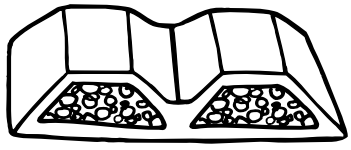
1C One Half



1 Colour $\frac{1}{2}$ of each.



a



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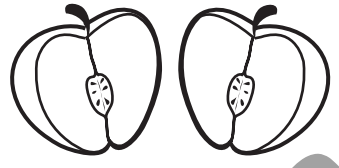

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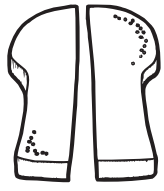
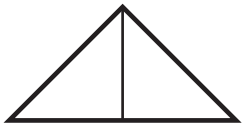


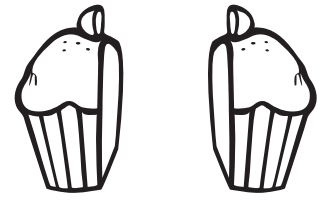
d

e



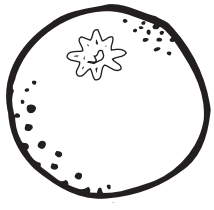
f

g



2 Draw a line to cut each object into halves. Colour one half of each.

a



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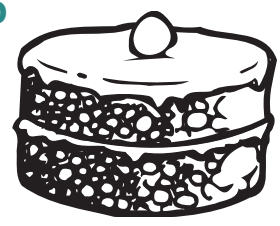

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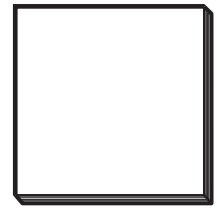

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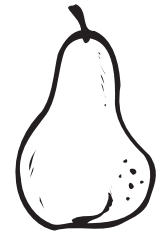
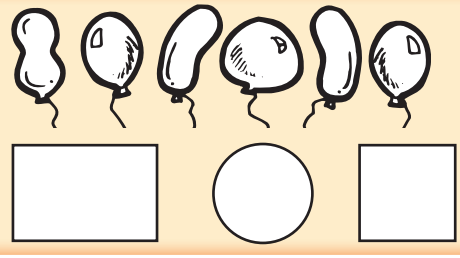
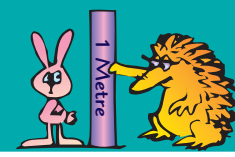


3 **a** Colour half of this group of balloons.

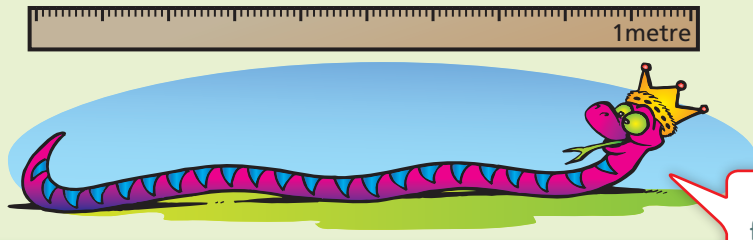
b Colour $\frac{1}{2}$ of each shape.



30C The Metre



One metre is about two of your steps.



1 metre

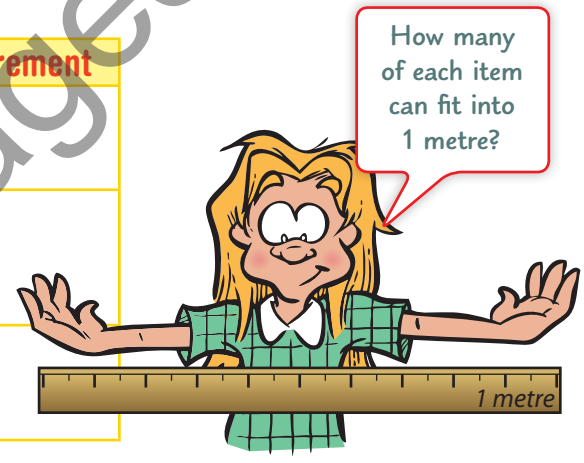
1 m

CONCEPT

1 Make a list of objects that are about 1 metre long.

2 Cut a strip of paper that is 1 metre long. How many of each item would it take to make 1 m?

Item		Estimate	Measurement
	How many shoes?		
	How many books?		
	How many hands?		



3 Match each length with the best answer.

- height of a tree
- width of a door
- length of a shoe
- length of a desk

- less than 1 metre
- about 1 metre
- more than 1 metre

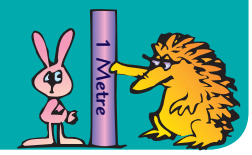
ACTIVITY

Estimate and measure each length to the nearest metre.

Length	Estimate	Measure
length of 10 steps		
length of 20 steps		

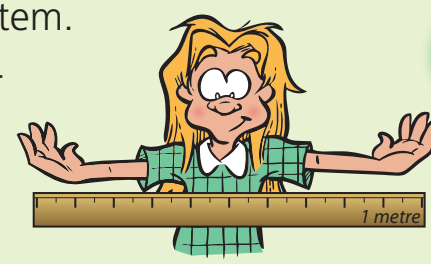
Length	Estimate	Measure
classroom length		
classroom width		

30D Metres and Centimetres



CONCEPT

- The metre is a standard unit of the metric system.
- One metre is usually about the length of your arm span, or two of your steps.
- 1 metre (1 m) = 100 centimetres (100 cm).
  1 cm ⟷ This length is 1 centimetre.



ACTIVITY

1 Estimate and measure each length to the nearest metre or half metre.

Length	Estimate	Measurement
length of 10 steps	m	m
width of the school gate	m	m
length of the classroom	m	m
distance to the canteen	m	m

2 Match each length with the best answer.

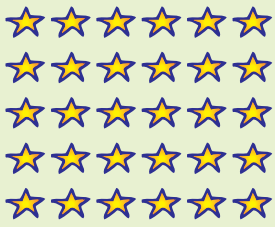
width of a door	1 metre	height of yourself
length of a whiteboard	2 metres	length of a car
height of a door	5 metres	width of your desk
width of a window		length of ten steps

3 Measure the following. Show whether each length is less than, about or more than 1 metre.

	Less than 1 m	About 1 m	More than 1 m
shoulder to toe			
standing jump			
height of your teacher			

Why do we need to use metres and centimetres to measure length?

31A Multiplication



5 rows of 6 = 30

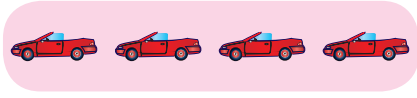
6 rows of 5 = 30

so

$5 \times 6 = 6 \times 5$

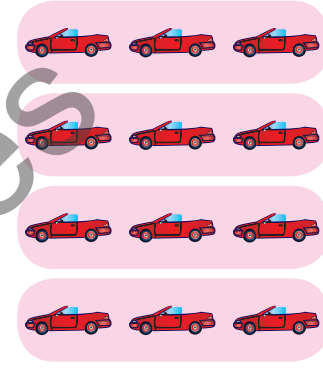
1

How many are in 3 rows of 4? ☐



How many are in 4 rows of 3? ☐

True or false?
$3 \times 4 = 4 \times 3$ ☐

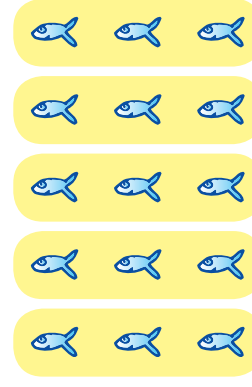


2

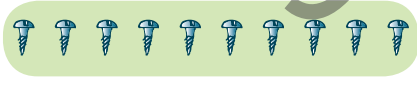
How many are in 3 rows of 5? ☐

How many are in 5 rows of 3? ☐

True or false?
$3 \times 5 = 5 \times 3$ ☐



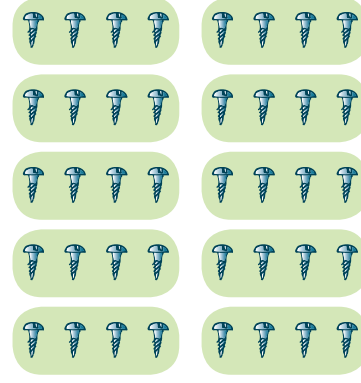
3



How many are in 4 rows of 10? ☐

How many are in 10 rows of 4? ☐

True or false?
$4 \times 10 = 10 \times 4$ ☐

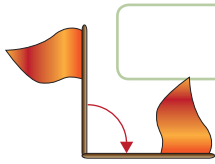
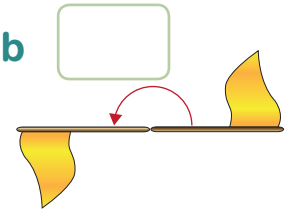
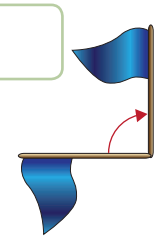
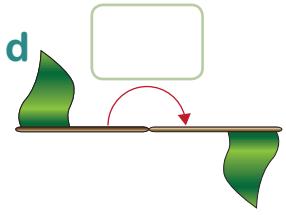


4 True or false?

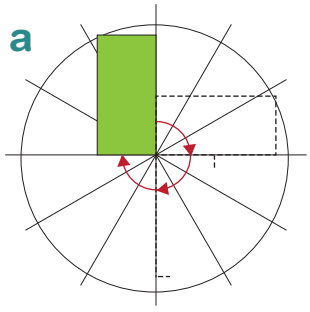
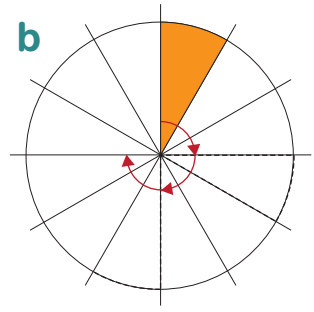
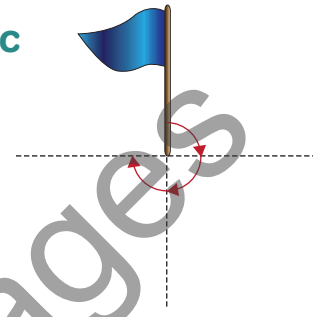
$2 \times 10 = 10 \times 2$ ☐ $3 \times 6 = 6 \times 3$ ☐ $8 \times 4 = 4 \times 8$ ☐

36C Half and Quarter Turns

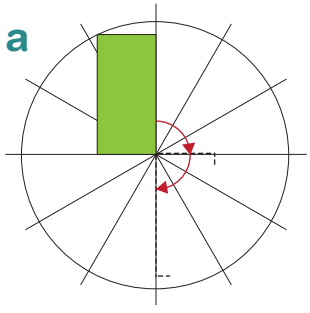
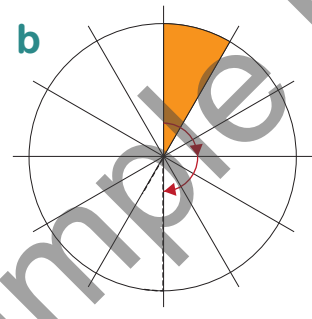
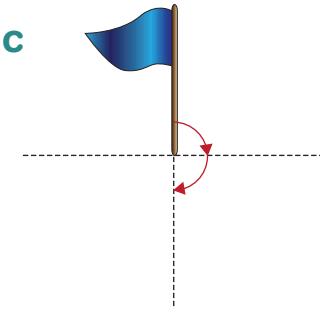
1 Write an 'H' for the half turns and a 'Q' for the quarter turns.

a  b  c  d 

2 Continue the **quarter turn** pattern to finish each design.

a  b  c 

3 Continue the **half turn** pattern to finish each design.

a  b  c 

4 Describe each turn in Question 1 as either clockwise or anti-clockwise.

a _____ b _____

c _____ d _____

INVESTIGATION

A tessellation is a repeating pattern using a shape that leaves no gaps and does not overlap. Circle the tessellations.