

Maths Trek

Exploring maths in the real world

4
NSW STAGE 2



Take a look inside!
As you explore these sample pages, look out for these handy notes which point out the important information and exciting features of Maths Trek.

Sample Student Book Pages
(NSW Syllabus Edition)

firefly
EDUCATION

Your Maths Trek Teacher Guide

Maths Trek is a whole-school numeracy program that provides everything you and your students need to explore maths in real-world contexts.

To maximise the benefits of the program, use the Student Book with the explicit teaching resources at Maths Trek Online to build, develop and strengthen each student's ability to work mathematically.

An adventure in maths for every student from Kindergarten to Year 6!

Maths Trek Online

Maths Trek Online is home to lesson guides, teaching slides, interactive teaching tools, videos, printable differentiation tasks and mid-term assessments.

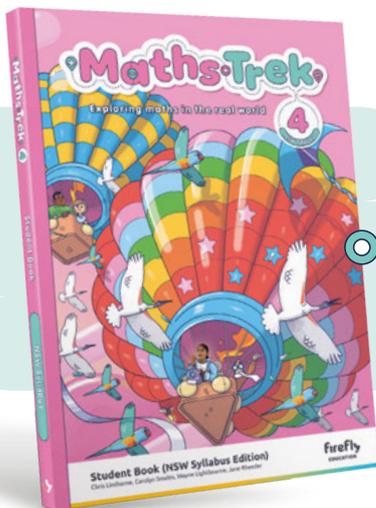
You will also find investigation notes, Student Book answers, and preparation and planning documents at Maths Trek Online.



Maths Trek Student Book

The Student Book is packed with modelled examples, as well as teacher-guided and independent activities for every topic and problem-solving strategy.

Students will also find plenty of practice problems, revision activities, application questions and investigation pages in the Student Book.



Using the Student Book with Online

Topics

Use the online lesson guides and teaching slides to explicitly teach each topic.

Discuss any modelled examples and complete the *Work together* activities with your students. Then students move on to the *Your turn* activities for independent practice.

The Student Book is an integral part of the consolidation process. Once you have explicitly taught each concept, it is essential that students apply what they have learned to the activities.

Revision

Use the revision activities throughout the Student Book to consolidate each student's learning and identify strengths and weaknesses.

Problem-solving

Use the videos, teaching slides and modelled examples in the Student Book to teach each problem-solving strategy.

Students consolidate their skills throughout the year by independently completing practice problems. These build confidence in choosing appropriate strategies to solve a variety of unfamiliar problems.

Download the *Problem-Solving Progress Checklist* to record each student's progress throughout the year.

Investigations

Investigations provide students with opportunities to apply maths concepts learned in previous weeks to unfamiliar, extended mathematical problems.

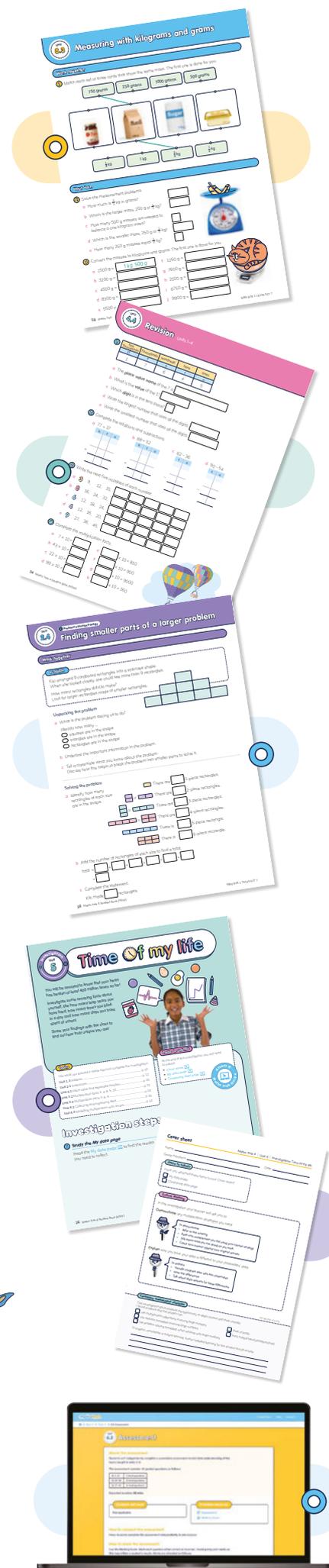
Use the online teaching notes, exemplars, videos and printable resources to introduce and guide students through each step of the investigation.

Use the online critical thinking lessons to ensure students can reflect, reason and communicate their understanding of what they have discovered.

Download the *Cover sheet* and use the formative assessment checklist to record each student's progress.

Assessment

Download the four mid-term assessments at Maths Trek Online to assess each student's understanding of the preceding topics. Each assessment includes graded C to A level questions.



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Want more investigations?

You'll find extra investigations at Maths Trek Online – a great way to round off a year of maths!

Planning made easy

Maths Trek guides you and your students through a sequence of topics, problem-solving, revision and investigations. As the year progresses, your students consolidate their learning and revisit concepts. They also have ample opportunity to apply what they've learned to unfamiliar, extended maths problems.

You'll find four assessments in the Yearly Plan too – one for each term. They assess each student's understanding of the preceding topics and are available to print at Maths Trek Online.

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Extra investigations

Conclude term 4 with one of these investigations. Log in to Maths Trek Online to access the printable pages and resources.

-  **Investigation: Lengthy leaps**
-  **Investigation: Fraction fun**
-  **Investigation: Puzzling perimeters**
-  **Investigation: Angle art**

* Log in to Maths Trek Online to download and print assessments.

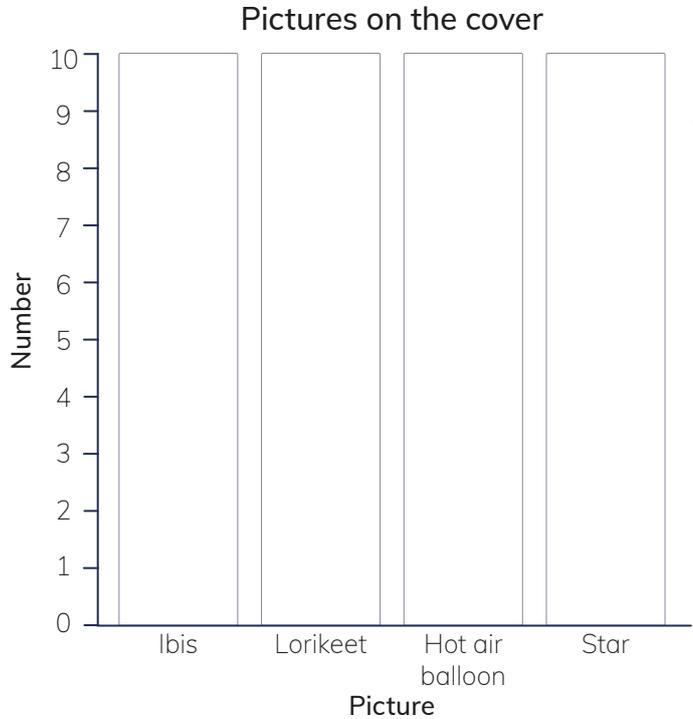


Tally time

Look at the front cover of your book.
Tally the pictures, then write the totals.

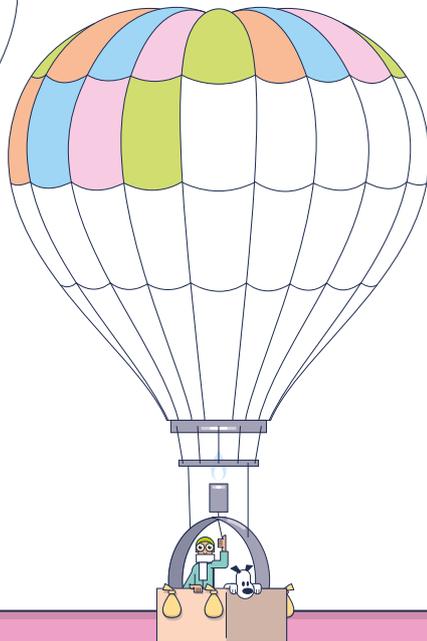
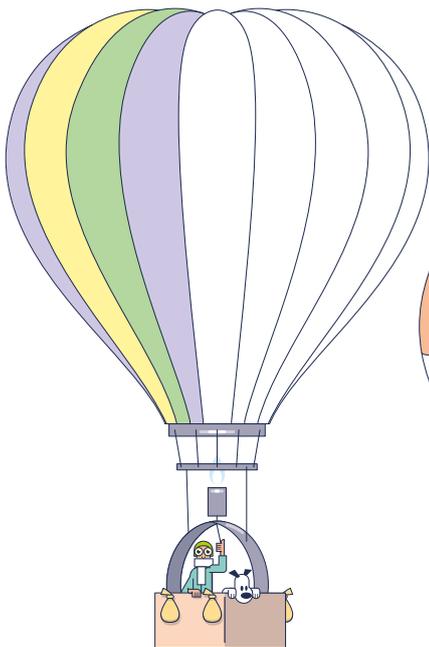
Picture	Tally	Total
 Ibis		
 Lorikeet		
 Hot air balloon		
 Star		

Use the data from the table to complete the column graph.

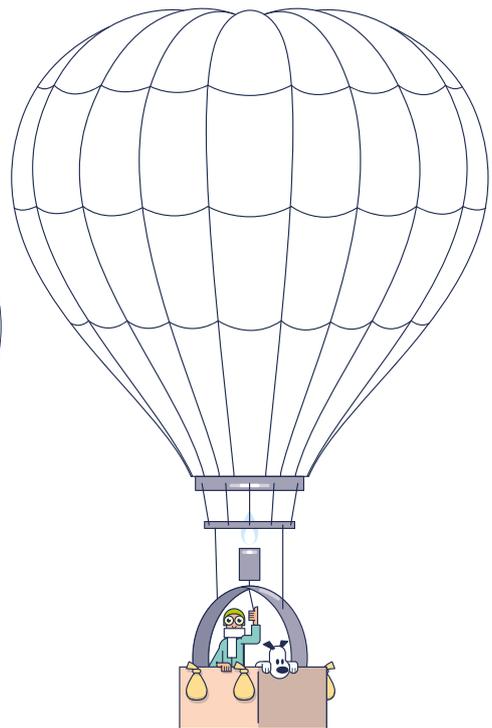


Balloon patterns

Complete the repeating patterns.



Make your own repeating pattern.

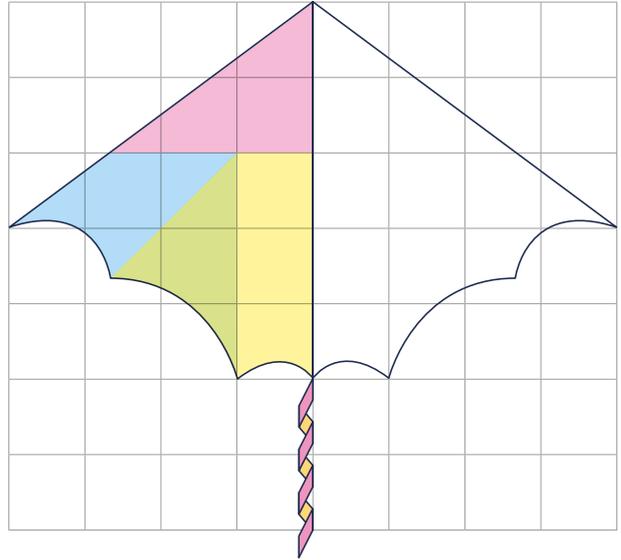
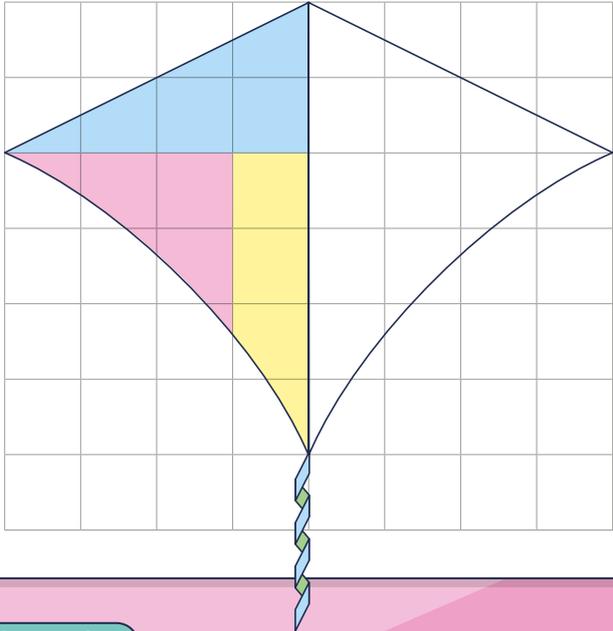


Engaging activities from day one

Get your students excited about maths as they apply skills learned in the previous year to these fun activities – all cleverly inspired by the art on the cover.

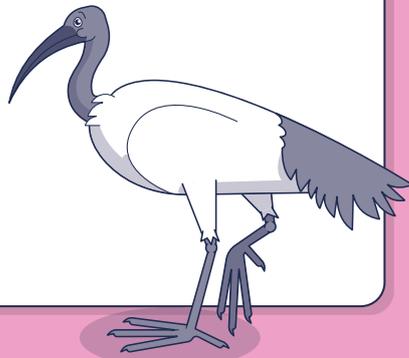
Mirror images

Draw the reflection of the patterns to complete the



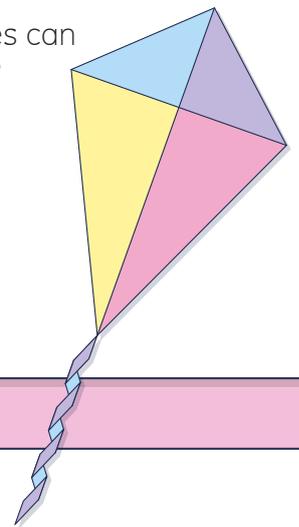
Ibis maths

An ibis has four toes on each foot.
How many toes in a flock of 40 ibises?



Triangle search

How many triangles can you find in the kite?



Up, up and away!

A hot air balloon rises 110 metres every minute.
If it starts on the ground, how high will the balloon be in 5 minutes?

Time (minutes)	1	2	3		
Height above the ground (metres)	110				



Work together

ten Thousands	Thousands	hundreds	tens	ones
tT	T	h	t	o
1	9	4	2	5

Tip

Use a space to separate the thousands when writing a number with 5 or more digits.

12 345 ✓ 1234 ✓

1 Complete the statements about the number 19 425. The first one is done for you.

- a The place value name of the 1 is . Its value is .
- b The place value name of the 2 is . Its value is .
- c The place value name of the 5 is . Its value is .
- d The place value name of the 9 is . Its value is .

Your turn

2 This odometer shows a car has travelled 25 831 kilometres.

- a Which digit is in the **thousands** place in 25 831?
- b Which digit is in the **ones** place in 25 831?
- c Which digit is in the **ten thousands** place in 25 831?
- d Which digit is in the **hundreds** place in 25 831?
- e Which digit is in the **tens** place in 25 831?



3 Write the value of each digit. Be careful, the answer boxes are rearranged for each number.

a

<input type="text"/>	<input type="text"/>	
<input type="text"/>	86 828	<input type="text"/>
<input type="text"/>		<input type="text"/>

c

<input type="text"/>	<input type="text"/>	
<input type="text"/>	37 514	<input type="text"/>
<input type="text"/>		<input type="text"/>

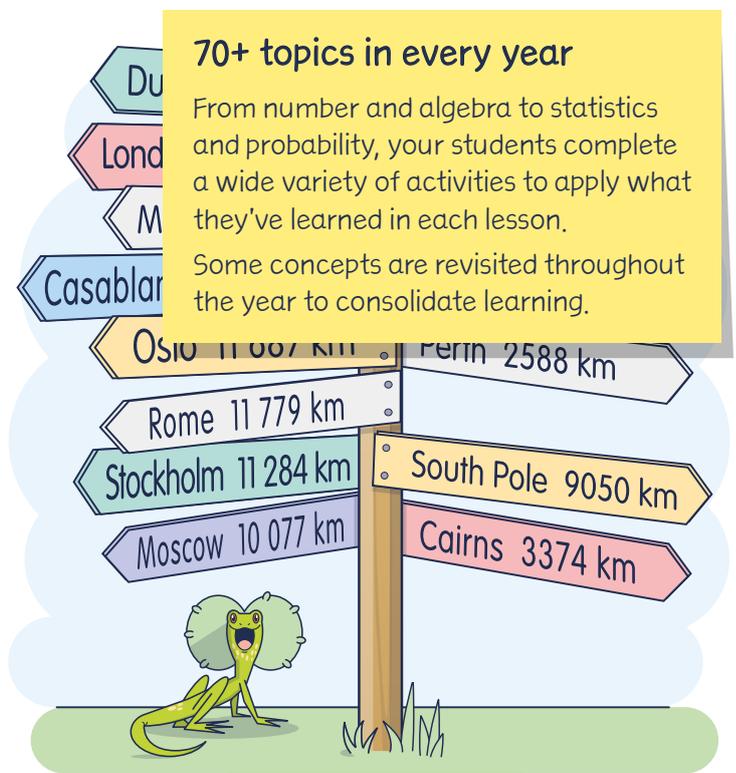
b

<input type="text"/>	<input type="text"/>	
<input type="text"/>	54 971	<input type="text"/>
<input type="text"/>		<input type="text"/>

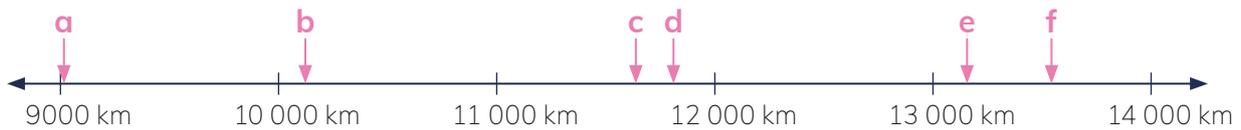
d

<input type="text"/>	<input type="text"/>	
<input type="text"/>	22 222	<input type="text"/>
<input type="text"/>		<input type="text"/>

- 4 a Which city has a 1 in the hundreds place?
- b Write the place value name of the 8 in Oslo's distance.
- c What is the value of the 1 in Moscow's distance?
- d Which city has a 7 in the hundreds place?
- e How many cities have a 1 in the thousands place?



- 5 Write the name of a city or location from the picture in question 4 to match each letter.



- | | | | |
|---|----------------------|---|----------------------|
| a | <input type="text"/> | d | <input type="text"/> |
| b | <input type="text"/> | e | <input type="text"/> |
| c | <input type="text"/> | f | <input type="text"/> |

- 6 Match the distances written in words to the correct cities in question 4. There will be some cities left over.

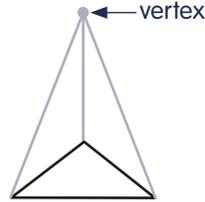
- thirteen thousand, one hundred and thirty-seven kilometres
- thirteen thousand, six hundred and forty-two kilometres
- eleven thousand, six hundred and eighty-seven kilometres
- eleven thousand, seven hundred and seventy-nine kilometres
- eleven thousand, two hundred and eighty-four kilometres

- Casablanca 13 642 km
- Perth 2588 km
- Rome 11 779 km
- Madrid 13 137 km
- Oslo 11 687 km
- Cairns 3374 km
- Stockholm 11 284 km
- Melbourne 4346 km
- Moscow 10 077 km
- Dublin 12 881 km

Work together

How to draw a triangular pyramid

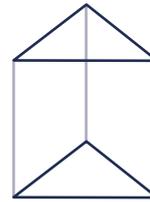
- Draw the base (a triangle).
- Use a ruler to connect the vertices of the base to the vertex.



A pyramid is a 3D object with a plane shape as a base, and triangular faces that taper to a point (vertex).

How to draw a triangular prism

- Draw two identical faces (triangles).
- Use a ruler to connect the matching corners (vertices) of the two faces.



A prism is a 3D object with two identical parallel faces. All other faces are rectangles.

1 Draw the pyramid and prism.

a Draw a pentagonal pyramid.



There are
 faces
 edges
 vertices

b Draw a pentagonal prism.



There are
 faces
 edges
 vertices

Your turn

2 Draw the pyramid and prism.

a Draw a hexagonal pyramid.



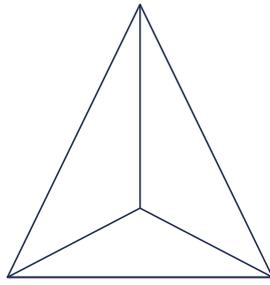
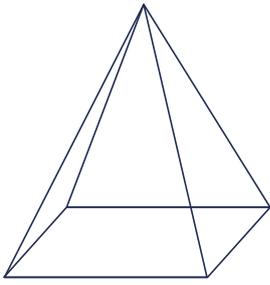
There are
 faces
 edges
 vertices

b Draw a hexagonal prism.

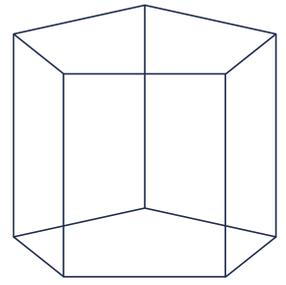
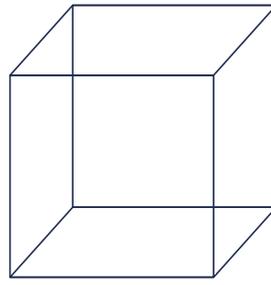


There are
 faces
 edges
 vertices

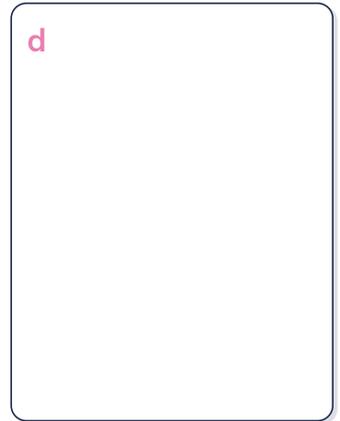
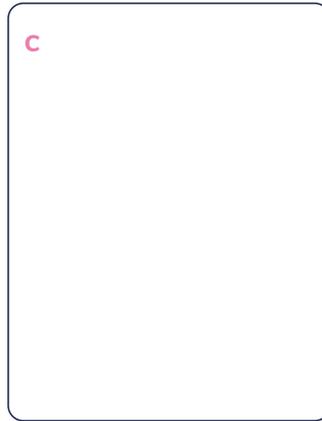
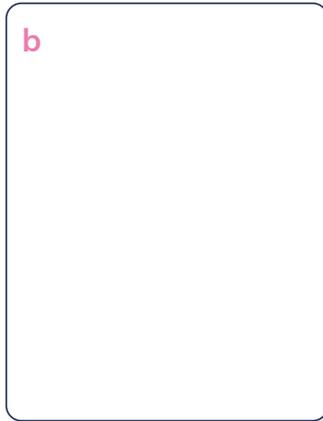
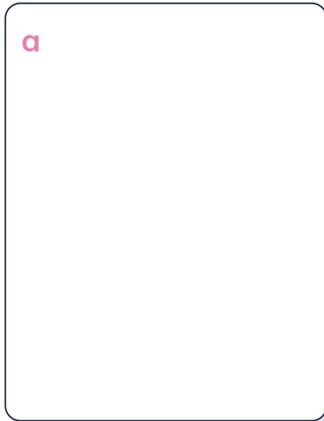
3 a Colour the base of each pyramid.



b Colour two identical faces on each prism.



4 Draw the pyramids and prisms in question 3.

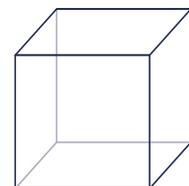


5 Trace the pyramids and prisms in each picture. Use one colour for pyramids and another for prisms.



Challenge

Drawings of prisms and pyramids do not need to be see-through. Draw a prism using light lines. Go over all lines except the ones behind the front faces. Then rub out the light lines. You will now have a solid prism.



ten Thousands	Thousands	hundreds	tens	ones
tT	T	h	t	o
1	7	6	4	5

- 1
- a The **place value name** of the 7 is .
- b What is the **value** of the 1?
- c Which **digit** is in the tens place?
- d Write the **largest** number that uses all the digits.
- e Write the **smallest** number that uses all the digits.

2 Complete the additions and subtractions.

a $77 + 37$

h	t	o
7	7	
3	7	
+		

b $88 + 52$

h	t	o
8	8	
5	2	
+		

c $62 - 36$

t	o
6	2
3	6
-	

d $90 - 54$

t	o
9	0
5	4
-	

3 Write the next five multiples of each number.

a 3 9, 12, 15,

b 8 16, 24, 32,

c 6 12, 18, 24,

d 4 12, 16, 20,

e 9 27, 36, 45,

4 Complete the multiplication facts.

a $7 \times 10 =$

e $\times 10 = 810$

b $43 \times 10 =$

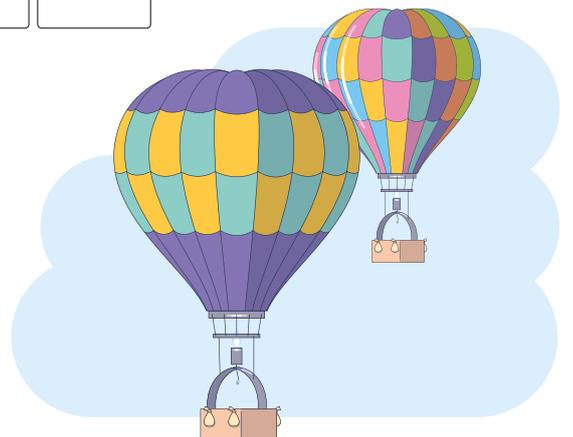
f $\times 10 = 900$

c $22 \times 10 =$

g $\times 10 = 9000$

d $99 \times 10 =$

h $\times 10 = 160$



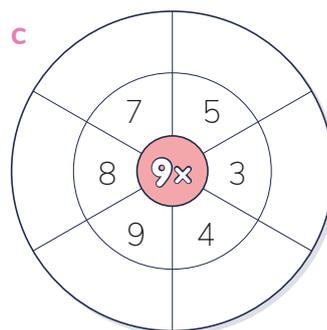
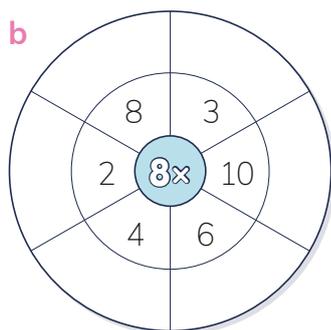
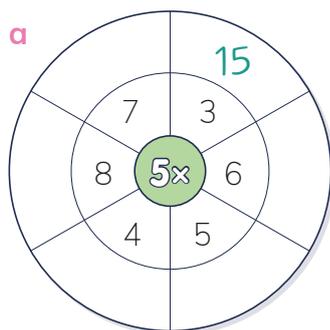
5 Complete the table.

Numeral	Word form
49 160	
	eighty-three thousand, six hundred and fourteen
	forty thousand, two hundred and seven

Regular revision

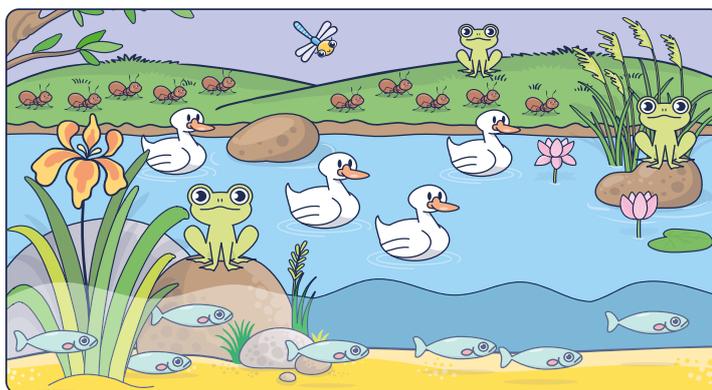
Every 4–5 weeks, your students complete revision activities based on the preceding topics. This regular revision is great for consolidating learning and identifying each student's strengths and weaknesses.

6 Complete the multiplication circles.

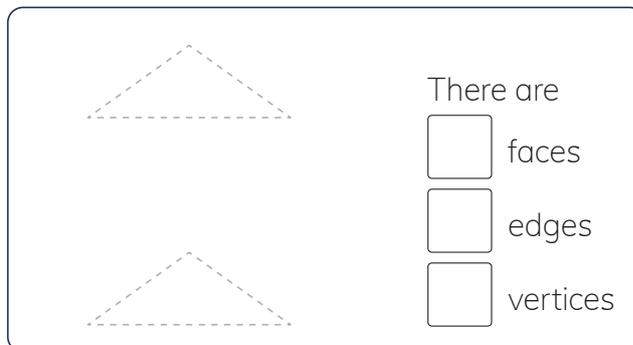
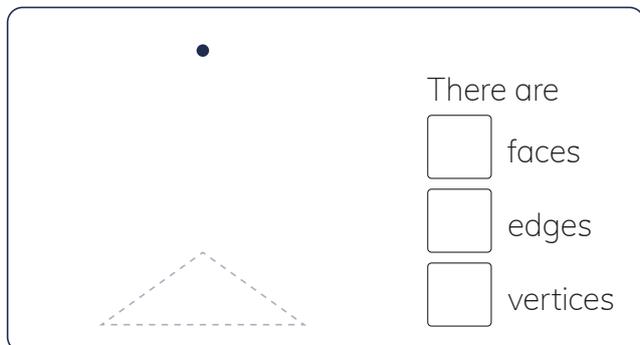


7 Use tally marks (||||) to show how many, then write the totals.

Object	Tally	Total



8 Draw a triangular pyramid and a triangular prism.



9 Write the answer to each multiplication inside the model.



Time of my life

You will be amazed to know that your heart has beaten at least 400 million times so far!

Investigate some amazing facts about yourself, like how many leap years you have lived, how many times you blink in a day and how many days you have spent at school.

Share your findings with the class to find out how truly unique you are!



Topics

Use what you learned in these topics to complete the investigation.

- Unit 1.3 Addition p 10
- Unit 2.1 Subtraction p 12
- Unit 3.1 Place value and expanded notation p 20
- Unit 3.2 Multiplication facts 2, 4, 8, 5, 10 p 22
- Unit 3.3 Multiplication facts 3, 6, 9 p 24
- Unit 4.2 Collecting and organising data p 30
- Unit 4.3 Modelling multiplication with arrays p 32

Items to submit

At the end of this investigation you will need to submit:

- Cover sheet
- My data page
- Comparing data page



Investigation steps

1 Study the *My data page*

Read the [My data page](#) to find the results you need to collect.



2 Gather necessary information

Brainstorm with your classmates how you are going to count, calculate and record data such as the number of blinks, breaths, heartbeats and days in a school year.

3 Calculate how many days you have lived

You can follow these steps or go ahead and use your own strategy. Knowing how many days you have lived will help you with other calculations.

1. Multiply your age in whole years by 365.
2. Count one day for each of the leap years you have lived.
3. Count the number of days since your last birthday. Do this month by month.
4. Add the totals to find the number of days you have lived.

4 Calculate the other facts

You should now be able to calculate all the amazing facts you need to complete your [My data page](#) .

You might like to investigate other facts about yourself, for example, how many times you have brushed your teeth or how many hours you have slept in your life.

Include all your working to show how you calculated each fact.

5 Compare and contrast your data

Complete the table on your [Comparing data page](#)  to record your data next to two other classmates' data.

Write five sentences comparing and contrasting all the data on your [Comparing data page](#) .

Share your findings with the class.

6 Critical thinking

Demonstrate any multiplication strategies you used.
Explain why you think your data is different to your classmates' data.



Bring maths to life

Designed to be conducted over a week, every investigation is packed with opportunities for your students to apply their maths skills to unfamiliar, extended problems.

Develop critical thinking skills

Critical thinking is an integral part of every investigation. At Maths Trek Online, you'll find critical thinking lessons, cognitive verb definitions, examples and hints – all designed to help your students craft well-reasoned responses when sharing and discussing results.

Inquiry

Based on your teacher's age, calculate how many times their heart has beaten.



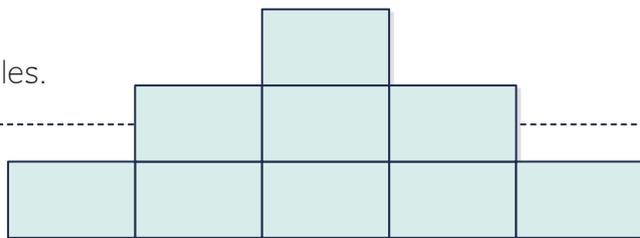
Finding smaller parts of a larger problem

Work together

Problem

Kiki arranged 9 cardboard rectangles into a staircase shape. When she looked closely, she could see more than 9 rectangles.

How many rectangles did Kiki make?
Look for larger rectangles made of smaller rectangles.



Unpacking the problem

a What is the problem asking us to do?

Identify how many ...

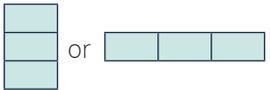
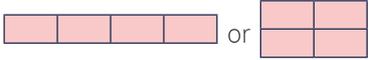
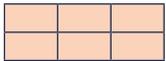
- squares are in the shape
- triangles are in the shape
- rectangles are in the shape

b Underline the important information in the problem.

c Tell a classmate what you know about the problem.
Discuss how this helps us break the problem into smaller parts to solve it.

Solving the problem

a Identify how many rectangles of each size are in the shape.

 There are 1-piece rectangles.
 There are 2-piece rectangles.
 There are 3-piece rectangles.
 There are 4-piece rectangles.
 There is 5-piece rectangle.
 There is 6-piece rectangle.

b Add the number of rectangles of each size to find a total.

$$\text{total} = \boxed{} + \boxed{} + \boxed{} + \boxed{} + \boxed{} + \boxed{}$$

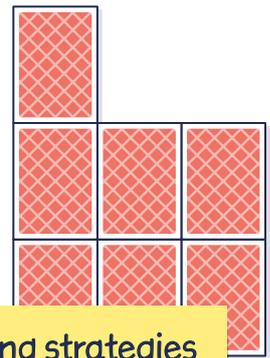
$$= \boxed{}$$

c Complete the statement.

Kiki made rectangles.

Problem A

Serena made a shape using 7 rectangular cards.
 How many rectangles did she make?
 Look for larger rectangles made of smaller rectangles.



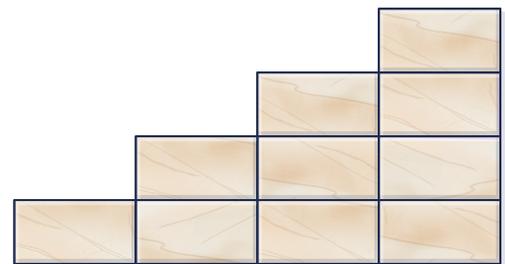
Serena made rectangles.

Nine problem-solving strategies

Use the online teaching resources and scaffolded *Work together* problem to explicitly teach each strategy. Then give your students independent practice at applying the strategy as they complete the *Your turn* problems.

Problem B

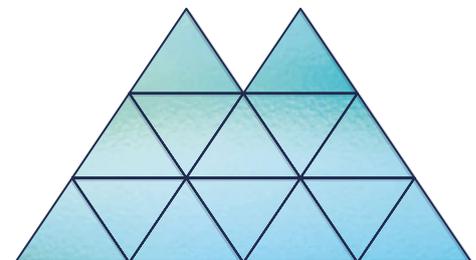
Billy arranged 10 bathroom tiles into a staircase shape.
 How many rectangles did he make?
 Look for larger rectangles made of smaller rectangles.



Billy made rectangles.

Problem C

Mia saw a window at a museum that was made of many triangular panels. She counted all the triangles of different sizes she could see.
 How many triangles did Mia count?



Mia counted triangles.

Problem A

Three groups of students are preparing for a science experiment. Every student selects one jug of water and takes it back to their group. Each group needs exactly 1 litre of water for the experiment.

Identify which jugs of water each group needs.



group 1



group 2



group 3



100 mL



150 mL



300 mL



350 mL



400 mL



500 mL



600 mL



600 mL

group 1

 mL

 mL

 mL

group 2

 mL

 mL

group 3

 mL

 mL

 mL

Think critically

a How did you solve the problem? Tick the strategy or strategies you used.

- | | |
|--|--|
| <input type="checkbox"/> Guessing and checking | <input type="checkbox"/> Drawing a picture or diagram |
| <input type="checkbox"/> Acting out the problem | <input type="checkbox"/> Finding a pattern or using a rule |
| <input type="checkbox"/> Solving a simpler problem | <input type="checkbox"/> Making an organised list |
| <input type="checkbox"/> Making a table or chart | <input type="checkbox"/> Finding smaller parts of a larger problem |
| <input type="checkbox"/> Working backwards | |

b What if one of the jugs with 600 mL held 300 mL instead?
Explain whether all three groups could collect an equal volume of water.

Problem B

Renee's puppy Rex is growing fast! Renee weighs Rex on the same day each week. Two weeks ago he weighed 3.2 kg. Last week he weighed 3.4 kg. Today the scales showed 3.6 kg. Predict how much Rex will weigh four weeks from today.



Plenty of problem-solving practice

As the year progresses, your students practise choosing appropriate problem-solving strategies to solve a variety of unfamiliar problems.

In four weeks Rex will weigh kg.

Share and discuss

Encourage your students to share their solutions and explain how they used their chosen strategies. Then discuss the extra related problem with your students to further develop their critical thinking skills.

Think critically

a How did you solve the problem? Tick the strategy or strategies you used.

- | | |
|--|--|
| <input type="checkbox"/> Guessing and checking | <input type="checkbox"/> Drawing a picture or diagram |
| <input type="checkbox"/> Acting out the problem | <input type="checkbox"/> Finding a pattern or using a rule |
| <input type="checkbox"/> Solving a simpler problem | <input type="checkbox"/> Making an organised list |
| <input type="checkbox"/> Making a table or chart | <input type="checkbox"/> Finding smaller parts of a larger problem |
| <input type="checkbox"/> Working backwards | |

b What if Rex only gained 100 g per week after reaching 3.6 kg? Predict how much Rex would weigh in four weeks.

The Maths Trek Program

Maths Trek is a whole-school numeracy program for Kindergarten to Year 6 that develops mathematical understanding, fluency, reasoning and problem-solving skills.

The Student Book together with the explicit teaching resources at Maths Trek Online build, develop and strengthen each student's ability to work mathematically.

Use the comprehensive online teaching resources to explicitly teach each concept before students apply their learning in the Student Book.



In this book students will find ...

- shared *Work together* activities
- modelled examples
- independent activities to develop and master maths skills
- concepts revisited throughout the year
- scaffolded problems to learn key problem-solving strategies
- practice problems to build confidence in applying the strategies
- real-world investigations where students apply maths skills to unfamiliar, extended mathematical problems to strengthen connections between concepts
- regular revision to consolidate learning

At Maths Trek Online teachers will find ...

- explicit teaching slides and lesson guides for every topic and problem-solving lesson
 - engaging visuals and hands-on activities in lessons
 - differentiation tasks
 - interactive teaching tools
 - investigation videos
 - digital and printable resources to guide students through every investigation
 - critical thinking lessons
 - formative and summative assessments
- Maths Trek Online includes the teaching resources for all year levels and complimentary access to the student site.

Head to www.fireflyeducation.com.au/mathstrek to:

- view Maths Trek sample pages from other year levels
- download NSW Syllabus Match and Yearly Plan documents
- sign up for a free trial of the online teaching resources
- book a free professional learning workshop for your school.

