

Australian



Signpost

MATHS

Sample pages



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What is Australian Signpost Maths?

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

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

Australian Signpost Maths 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 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.

The **Mentals Book** mixes examples from all strands, reviewing the content of previous units of the Student Book.

The innovative **Website** help 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

- **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 for whole-class, small-group and individual learning.

Australian Signpost 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**.

Australian Curriculum Proficiency Strands

The proficiency strands of the Australian Curriculum describe how content is explored or developed – that is, the ‘thinking and doing’ of mathematics.

Understanding

Learning the concepts

*Students build a robust knowledge of adaptable and transferable mathematical concepts. They make connections between related concepts and progressively apply the familiar to develop new ideas. They develop an understanding of the relationship between the ‘why’ and the ‘how’ of mathematics.**

Conceptual understanding of maths ideas includes the explanation of a concept using text and diagrams. This occurs throughout Australian Signpost Maths at the top of many pages and is indicated by the Concept icon.

Fluency

Using the concepts

*Students develop skills in choosing appropriate procedures, carrying out procedures flexibly, accurately, efficiently and appropriately, and recalling factual knowledge and concepts readily.**

The practice of maths skills to build fluency occurs on every page of Australian Signpost Maths.

Problem Solving

Applying concepts and strategies to develop solutions to problems

*Students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively.**

Problem solving provides opportunities for students to use strategies and skills such as investigating and questioning, to collaborate with others and to communicate their findings to different audiences. Such activities are often indicated throughout Australian Signpost Maths by the Activity and Investigation icons.

Reasoning

Coherent and logical thought

*Students develop an increasingly sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising.**

Students require opportunities to explain their mathematical thinking and can do so through both diagrams and written explanations. Reasoning questions are located throughout Australian Signpost Maths.

*The Australian Curriculum: Mathematics, v1.2 – Content structure

Contents Cross-reference viii

Dictionary xii

Diagnostic Tests 128

KEY

	Number & Algebra
	Measurement & Geometry
	Statistics & Probability



Page	Unit	Title	Strand	Number and Algebra	Measurement and Geometry	Statistics and Probability	Sub-strand	Number and place value	Fractions and decimals	Money and financial mathematics	Patterns and algebra	Using units of measurement	Shape	Location and transformation	Chance	Data representation and interpretation	Suggested progress
1		Thinking Skills															Term 1
2	1A	Number Revision															
3	1B	Number Revision															
4	1C	Numbers 11 and 12															
5	1D	Numbers 11 to 16															
6	2A	Adding Two Groups															
7	2B	Addition Sentences															
8	2C	Numbers to 20															
9	2D	Numbers to 20															
10	3A	Ordinal Numbers															
11	3B	Subtraction															
12	3C	Analogue Time															
13	3D	Shapes Revision															
14	4A	Numbers to 20															
15	4B	Numbers to 20															
16	4C	Identifying Objects															
17	4D	3D Objects															
18	5A	Addition Sentences															
19	5B	Friends of 10															
20	5C	One Half															
21	5D	Introducing Graphs															
22	6A	Numbers to 20															T1*
23	6B	Subtraction															
24	6C	Patterns															
25	6D	Digital Time															
26	7A	Partitioning to 10															
27	7B	Sorting and Classifying Coins															
28	7C	Shapes in Our World															
29	7D	Using Pictures in Graphs															
30	8A	Addition Facts															Term 2
31	8B	Doubles															
32	8C	Units of Length															
33	8D	Informal Units of Length															
34	9A	Difference															
35	9B	Difference															
36	9C	Comparing Mass															
37	9D	The Oval and Other Shapes															

Page	Unit	Title	Strand	Number and Algebra	Measurement and Geometry	Statistics and Probability	Sub-strand	Number and place value	Fractions and decimals	Money and financial mathematics	Patterns and algebra	Using units of measurement	Shape	Location and transformation	Chance	Data representation and interpretation	Suggested progress
38	10A	Groups of 10															
39	10B	Place Value															
40	10C	Australian Coins															
41	10D	Left and Right															
42	11A	Subtraction															
43	11B	Difference Between Groups															
44	11C	Position Language															
45	11D	Location Language															
46	12A	Groups of 10															
47	12B	Counting by 10s															
48	12C	Difference															
49	12D	The Hexagon															
50	13A	Counting On															
51	13B	Shape Hunt															
52	13C	Time Revision															
53	13D	Analogue and Digital Time															
54	14A	Numbers to 100															
55	14B	Numbers to 100															
56	14C	Counting Back															
57	14D	Drawing Shapes															
58	15A	The Number Line															
59	15B	The Calculator															
60	15C	Informal Units of Capacity															
61	15D	Informal Units of Capacity															
62	16A	Numbers to 20															
63	16B	Addition to 20															
64	16C	Addition to 20															
65	16D	Chance Words															
66	17A	Numbers to 100															
67	17B	Numbers to 100															
68	17C	Addition to 20															
69	17D	Recognising 3D Objects															
70	18A	Numbers to 100															
71	18B	Partitioning															
72	18C	Partitioning															
73	18D	Half Past															
74	19A	Subtraction to 20															
75	19B	Subtraction by Counting On															
76	19C	One Half															
77	19D	Half of a Group															
78	20A	Numbers to 100															
79	20B	Counting by 2s, 5s and 10s															
80	20C	Looking at Patterns															
81	20D	Half Past															
82	21A	Number Relationships															
83	21B	Adding Equal Groups															

T2*

Term 3

Page	Unit	Title	Strand	Number and Algebra	Measurement and Geometry	Statistics and Probability	Sub-strand	Number and place value	Fractions and decimals	Money and financial mathematics	Patterns and algebra	Using units of measurement	Shape	Location and transformation	Chance	Data representation and interpretation	Suggested progress
84	21C	Graphing Data Using Blocks															
85	21D	Graphs															
86	22A	Partitioning															
87	22B	Partitioning															
88	22C	Informal Units of Length															
89	22D	Informal Units of Length															
90	23A	Place Value															
91	23B	Place Value															
92	23C	The Rhombus															
93	23D	2D Shapes															
94	24A	Numbers to 100															
95	24B	Place Value															
96	24C	Patterns															
97	24D	Months of the Year															
98	25A	Counting On															
99	25B	Addition by Counting On															
100	25C	Digital and Analogue Time															
101	25D	Making a Graph															
102	26A	Counting Back															
103	26B	Subtraction															
104	26C	Properties of Shapes															
105	26D	The Cube															
106	27A	Subtraction by Counting On															
107	27B	Addition															
108	27C	One Half															
109	27D	Giving Directions															
110	28A	Place Value															
111	28B	Relating Addition and Subtraction															
112	28C	Comparing Capacities															
113	28D	Comparing Capacities															
114	29A	Addition															
115	29B	How Many More?															
116	29C	Giving Directions															
117	29D	Chance Language															
118	30A	Inverse Operations															
119	30B	Number Patterns															
120	30C	Duration Using Weeks															
121	30D	Duration Using Hours															
122	31A	The Calculator															
123	31B	Calculators															
124	31C	Mass															
125	31D	Dot Patterns															
126	32A	Ordinal Numbers															
127		Appendix: Australian Money															

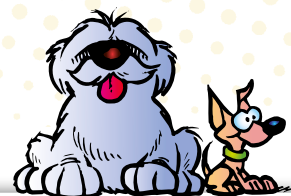
*Suggested placement for Progress Tests 1 to 4 (see the Teacher's Book). It is assumed that there are 10 weeks in each term.

Number and Algebra

1	Counting	Pages	Australian Curriculum Reference
	Count to and from any starting point up to 100	2, 3, 4, 5, 8, 9, 22, 54, 58, 62, 66, 94	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013); Count collections to 100 by partitioning numbers using place value (ACMNA014)
	Understand and reason with number sequences to and from 100	9, 22, 47, 58, 62, 66, 67, 79, 94	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013); Count collections to 100 by partitioning numbers using place value (ACMNA014)
	Say number sequences of twos, fives and tens starting from zero	47, 67, 70, 79, 80, 94	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012)
	Use a calculator to increase understanding of counting patterns	54, 82, 119, 122, 123	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012)
	Ordinal numbers	10, 126	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012)
2	Numeration		
	Model and represent numbers and the use of place-value cards	2, 3, 4, 8, 9, 14, 15, 38, 46, 54, 55, 90, 91, 94, 95	Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013); Count collections to 100 by partitioning numbers using place value (ACMNA014)
	Read, write and order numbers to 100	2, 3, 4, 5, 8, 14, 15, 62, 66, 67, 70, 78, 90, 91, 94, 95	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013); Count collections to 100 by partitioning numbers using place value (ACMNA014)
	Use Base 10 materials	14, 38, 46, 55, 95	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013); Count collections to 100 by partitioning numbers using place value (ACMNA014)
	Read numerals on a calculator	46, 54, 82, 110, 119	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013)
	Order numbers in sequences	22, 62, 66, 91	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013)

3	Place value		
	Count and record numbers by grouping in tens	9, 22, 39, 54, 55, 90, 91, 94, 95, 110	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Recognise, model, read, write and order numbers to at least 100, and locate these numbers on a number line (ACMNA013); Count collections to 100 by partitioning numbers using place value (ACMNA014)
	Partition and regroup numbers	9, 26, 71, 72, 82, 86, 87, 90, 95, 110	Count collections to 100 by partitioning numbers using place value (ACMNA014); Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
4	Fractions		
	One half as one of two equal parts	20, 76	Recognise and describe one-half as one of two equal parts of a whole (ACMNA016)
	Halves of collections	76, 77, 108	Recognise and describe one-half as one of two equal parts of a whole (ACMNA016)
5	Addition and subtraction		
	Model, represent and solve problems concerning addition	4, 6, 7, 18, 19, 26, 30, 31, 50, 59, 63, 64, 68, 71, 72, 82, 83, 86, 87, 96, 98, 99, 107, 111, 114, 115, 118, 122	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Model, represent and solve problems concerning subtraction	11, 23, 34, 35, 42, 48, 56, 74, 75, 96, 102, 103, 111, 115, 118	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Model, represent and solve problems concerning grouping	83, 123	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Connect addition and subtraction	75, 106, 111, 115, 118	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Problems involving a missing element	72, 75, 106, 107, 114, 122	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Subtraction (taking away)	11, 42, 74	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Subtraction (difference)	34, 35, 43, 48	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
	Mental strategies (count on, doubles, make to ten)	31, 50, 56, 59, 71, 72, 74, 75, 82, 86, 87, 98, 99, 102, 103, 106, 118	Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (ACMNA015)
6	Number patterns		
	Patterns with objects	24, 54, 80	Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018)
	Patterns with numbers	4, 24, 47, 70, 79, 80, 96, 119, 123	Develop confidence with number sequences to and from 100 by ones from any starting point, and skip count by twos, fives and tens starting from zero (ACMNA012); Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018)
7	Money		
	Recognise, describe and order Australian coins	27, 40, 101	Recognise, describe and order Australian coins according to their value (ACMNA017)

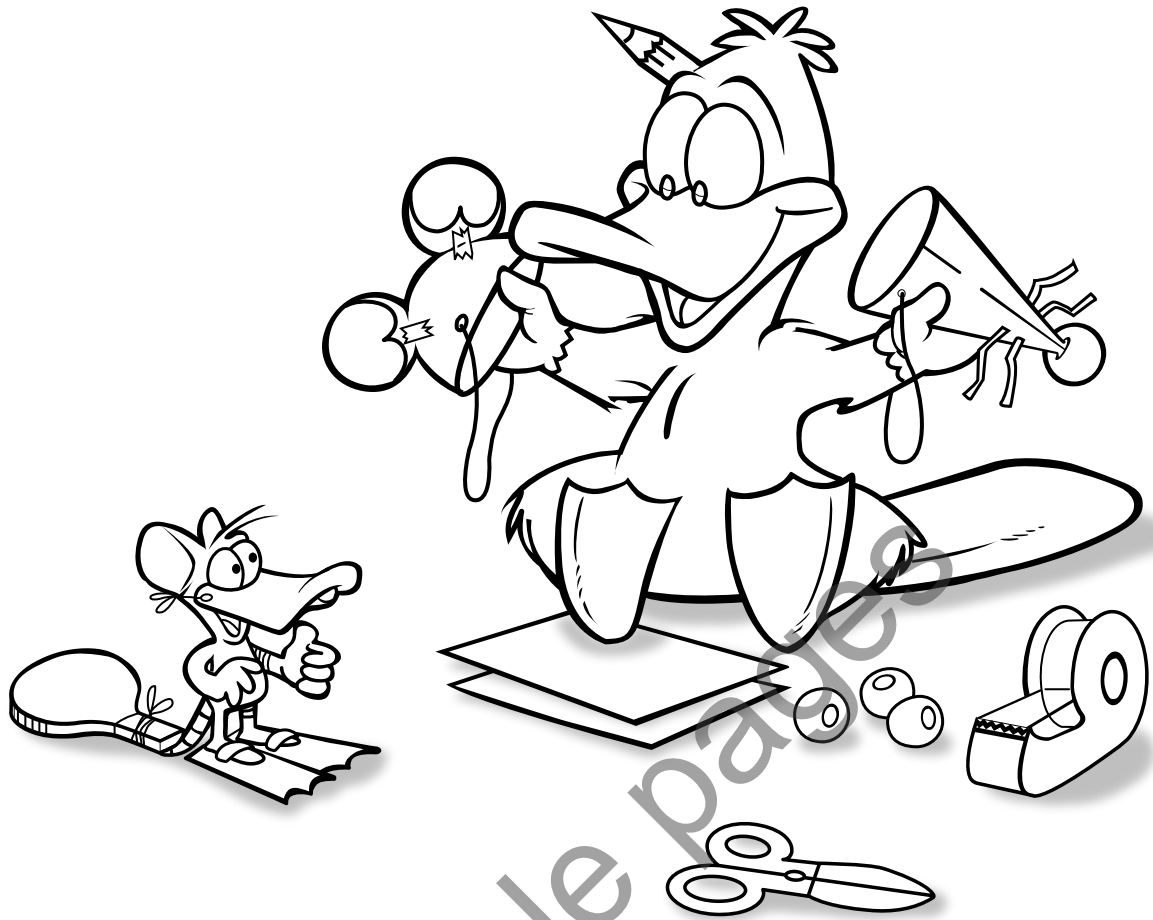
Measurement and Geometry



1	Length, capacity and mass	Pages	Australian Curriculum Reference
	Use uniform informal units to measure length	32, 33, 88, 89	Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)
	Use uniform informal units to measure capacity	60, 61, 112, 113	Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)
	Compare lengths	32, 89	Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)
	Compare capacity	61, 112, 113	Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)
	Comparing mass	36, 124	Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language (ACMMG006) <i>[Progression]</i>
2	Time		
	Read time to the hour and half hour on digital and analogue clocks	12, 25, 52, 53, 73, 81, 100	Tell time to the half-hour (ACMMG020)
	Make connections between common time sequences such as days of the week, months	97, 120	Describe duration using months, weeks, days and hours (ACMMG021)
	Duration of time: months, weeks, days, hours	97, 120, 121	Describe duration using months, weeks, days and hours (ACMMG021)
3	Geometry		
	Recognise, visualise and classify familiar 2D shapes	13, 37, 49, 57, 69, 92, 93, 104, 125	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
	Draw 2D shapes	13, 28, 57, 92, 93, 125	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
	Features of 2D shapes	37, 49, 57, 92, 93, 104	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
	Recognise, visualise and classify familiar 3D objects	16, 17, 28, 51, 69, 105	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
	Make models of 3D objects	51	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
	Features of 3D objects	69, 105	Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)
4	Location		
	Give and follow directions	41, 45, 109, 116	Give and follow directions to familiar locations (ACMMG023)
	Language of location	41, 44, 45, 109, 116	Give and follow directions to familiar locations (ACMMG023)

Statistics and Probability

1	Data representation	Pages	Australian Curriculum Reference
	Collecting data (class data)	84, 85, 88	Choose simple questions and gather responses (ACMSP262)
	Representing data	84, 85	Represent data with objects and drawings where one object or drawing represents one data value, and describe the displays (ACMSP263)
	Using and understanding picture graphs and other graphs	21, 29, 84, 85	Represent data with objects and drawings where one object or drawing represents one data value, and describe the displays (ACMSP263)
2	Data interpretation		
	Read and make connections between lists, tables and picture graphs	21, 29, 85, 88, 101	Choose simple questions and gather responses (ACMSP262); Represent data with objects and drawings where one object or drawing represents one data value, and describe the displays (ACMSP263)
	Convey the story told on a graph (draw conclusions) and make statements about data	21, 29, 84, 85, 101	Choose simple questions and gather responses (ACMSP262); Represent data with objects and drawings where one object or drawing represents one data value, and describe the displays (ACMSP263)
3	Chance		
	Possible outcomes from a chance event	117	Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen' (ACMSP024)
	Likely and unlikely events	65, 117	Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen' (ACMSP024)

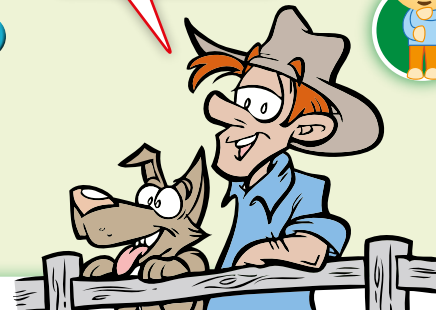


- 1 What can you count in this picture?
- 2 How many noses are in this picture?
- 3 Colour the round things red.
- 4 What are the mouse and the platypus doing?
- 5 The mouse is going to make a hat for its costume. Why should the mouse's hat have no ears?
- 6 What could the animals make with the paper?
- 7 How are the mouse and the platypus different?
- 8 Which of these questions have you liked best? Why?
- 9 Make up a maths question about this picture.



These are the first five counting numbers.

CONCEPT



1 Write the numeral and its name. Draw the number of balls.

			one	

2 Match each word with a numeral.

one

two

three

four

five

2

1

5

3

4

FUN SPOT

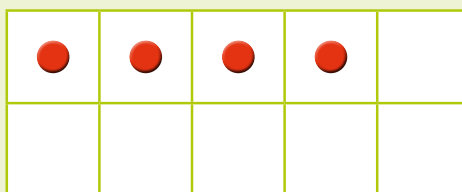
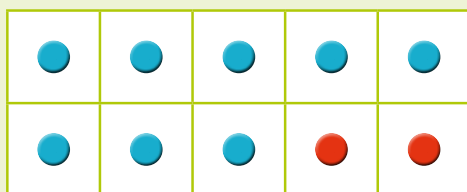




CONCEPT



Make groups of 10, then count on.



$$\begin{aligned}
 8 + 6 &= 8 + 2 + 4 \\
 &= 10 + 4 \\
 &= 14
 \end{aligned}$$

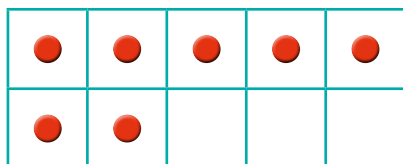


... 11, 12, 13, 14



1 To find the answer, draw more dots in the ten frames.

a



$$7 + 5 = 7 +$$

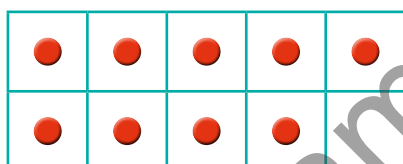
+

=

+

=

b



$$9 + 8 = 9 +$$

+

=

+

=

2 You can use ten frames to answer these questions.

a $7 + 6 =$

--

b $8 + 5 =$

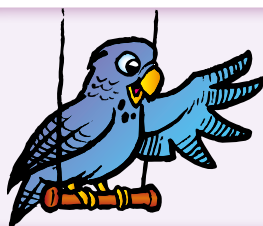
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c $9 + 4 =$

--

d $8 + 7 =$

--



Use place-value blocks to make your own patterns. Record each pattern and explain your patterns to a friend.

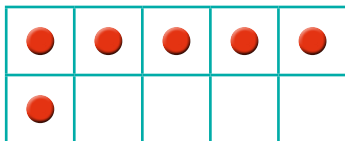
INVESTIGATION





1 To find the answer, draw more dots in the ten frames.

a



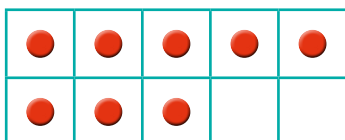
$$6 + 9 = 6 +$$

	+	
--	---	--

$$= \quad + \quad = \quad$$



b

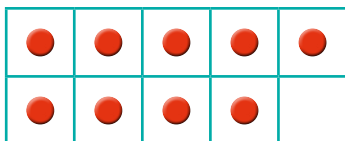


$$8 + 8 = 8 +$$

	+	
--	---	--

$$= \quad + \quad = \quad$$

c

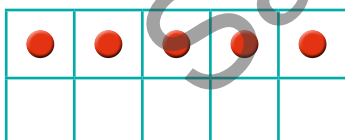


$$9 + 7 = 9 +$$

	+	
--	---	--

$$= \quad + \quad = \quad$$

d



$$5 + 6 = 5 +$$

	+	
--	---	--

$$= \quad + \quad = \quad$$

Make groups of ten, then count on.

INVESTIGATION



Use ten frames to make up some additions of your own.

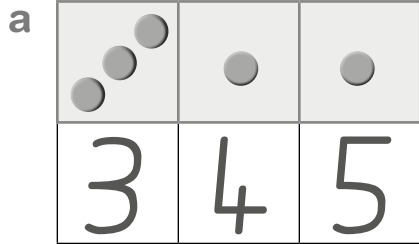


Progress Test 3

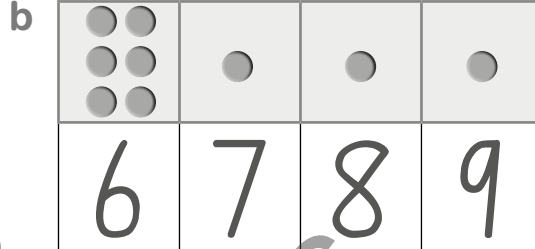
1 Write the numbers 12 to 19 in order.

								20
--	--	--	--	--	--	--	--	----

2 Count on to find how many altogether.

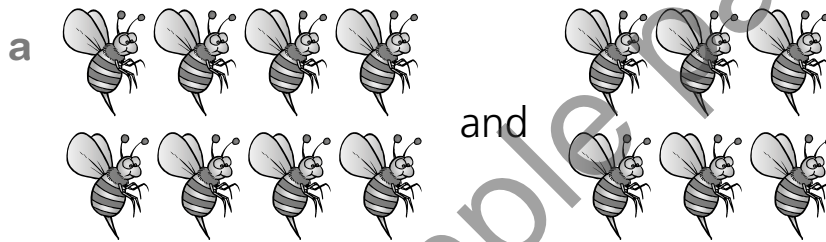


3 and 2 more =

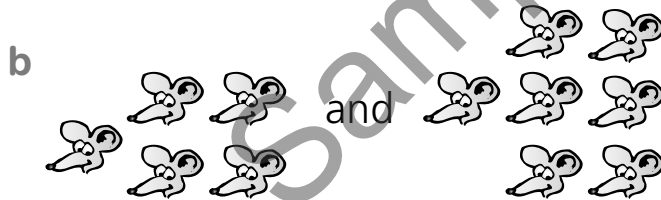


6 and 3 more =

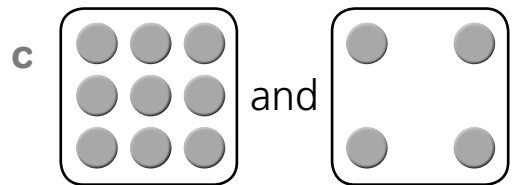
3 Complete the number sentences.



$8 + 6 =$



+ =



+ =

4 Colour the circles to show two different ways to make 9.



+ = 9

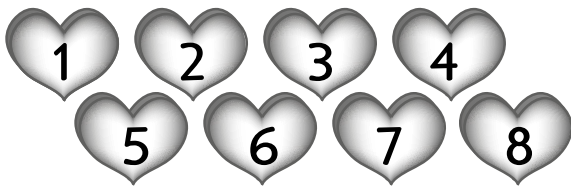


+ = 9

Progress Test 3 (continued)

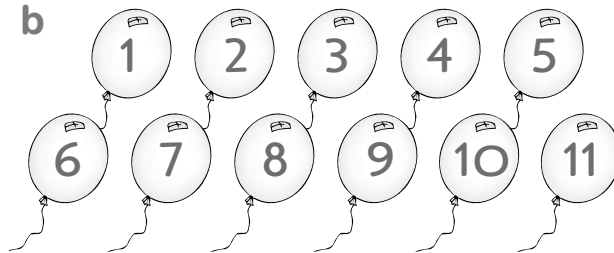
5 Count back to complete each number sentence.

a



8 take away 2 leaves

b



11 take away 4 leaves

6 a



14 - 9 =

b



How many more make 12?

c

8 +

= 12

d

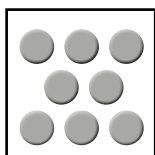
12 - 8 =

e

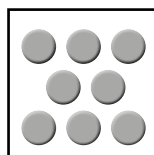


19 - 8 =

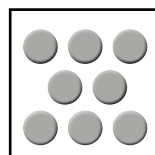
7



plus



plus



a

 + + =

b

 groups of =

Progress Test 3 (continued)

8 Write the numbers before and after.

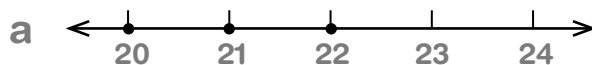
a

Before		After
	28	
	42	
	84	

b

Before		After
	53	
	76	
	91	

9 Write the numbers shown on each number line.

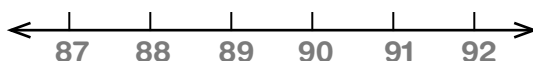


Show the numbers on each number line.

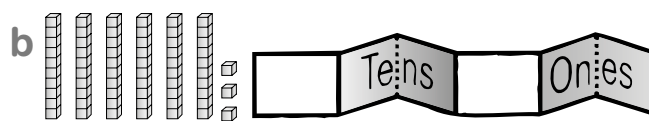
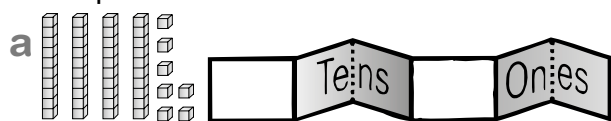
c 74, 75, 77, 79



d 88, 90, 91, 92



10 Complete:



Write the number.



