

AUSTRALIAN
Signpost
MATHS

NSW



Sample Pages

STAGE 1

2

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What is Australian Signpost Maths NSW?

Australian Signpost Maths NSW is a mathematics program providing direction and support for teaching and learning. The series covers the content and skills presented in the NSW Mathematics Syllabus K–6, 2022.

A Student Book and an online Teacher Resource are provided for Kindergarten (Early Stage 1).

For Years 1 to 6 (Stages 1–3), a Student Book, an online Teacher Resource and a Mentals Book are provided for each year level. The online Teacher Resources provide a wealth of support for teachers.

The content has been carefully sequenced within each year level and across the K–6 series to take into account students' expected mathematical development. However, from the rich and varied material provided, teachers can develop individual learning programs to meet the needs of each student.

The Student Books are designed to support explicit teaching methods. Many group activities are provided in Activity, Investigation and Fun spots within the Student Books and the online Teacher Resource.

To maximise the benefits of the program, the Student Book, the online Teacher Resource and the Mentals Book should be used together.



Student Books

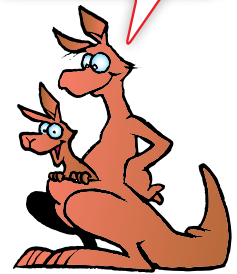


Mentals Books



Teacher Resource

This is Australian Signpost Maths New South Wales.



Structure of Australian Signpost Maths NSW

In the K–2 books, the worksheet pages covering all three strands are presented in a recommended order. Each unit of 4 pages usually begins with Number and algebra. The Contents cross-reference allows teachers to quickly find the pages where each concept has been covered.

Within the program, explicit teaching, working mathematically skills, language development and identification and treatment of weaknesses are given high priority.

Identification and addressing areas of need

Five progress tests are designed to identify each student's areas of need, and the follow-up program after each of the tests is designed to address these needs. A reference to the relevant worksheet page is given for each test question. A remediation record page is used to track the student's progress.

These testing resources can be found in the online Teacher Resource.

Parallel progress retests are provided for further testing after remediation has taken place. See pages 142 and 143 of this book for more information.

Progress test 2

Name: _____

Count on from 4

Count back from 7

Write the numbers in order from smallest to largest.

15, 11, 14, 19

Write how many are in each row.

Write the number after:

Write the number before:

Order the rows from smallest to largest using the letters.

Progress retest 2

Name: _____

Count on from 5

Count back from 6

Write the numbers in order from smallest to largest.

18, 14, 13, 17

Write how many are in each row.

Write the number after:

Write the number before:

Order the rows from smallest to largest using the letters.

Special features of Australian Signpost Maths NSW

● The traffic light icons

These are found on the top right of each worksheet page in the Student Books. They allow students to assess their own progress and give feedback to the teacher.

- **Green:** I found this work easy.
- **Orange:** I found some work on the page difficult.
- **Red:** I don't understand the work on this page.

● Dictionary

Terms used in the Student Book and terms that should be understood at this level are recorded here to provide a reference for students and teachers. This is found on pages xiii–xix of this book and in the online Teacher Resource.

● ID cards (Years 1 to 6)

These cards review the language of Mathematics by asking students to identify common terms, shapes and symbols. They are designed to be reused and are found in the online Teacher Resource and in the front of the Mentals Books.

● Progress tests

These allow the teacher to identify each student's strengths and needs. Cross-references for each question direct teachers and students to the pages where that work is introduced. Tables are provided to record the follow-up that takes place and parallel tests are provided for retesting. These tests can be found in the online Teacher Resource.

● Year 2 Consolidation booklet

This 32 page booklet is found in the online Teacher Resource. It is designed to reinforce work completed in class and provides practice of important skills and addition and subtraction facts. The booklet can be used when there is limited supervision or when a student finishes classwork early.

● Answers

These are supplied in the online Teacher Resource.

● Blackline masters (BLM)

References are made to the blackline masters in the teaching suggestions provided for each student work page.

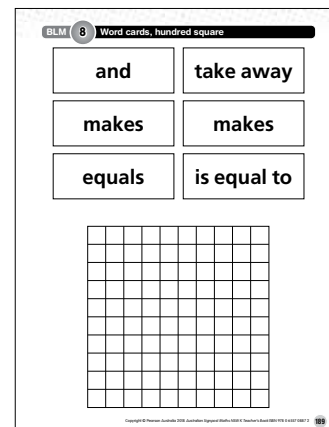
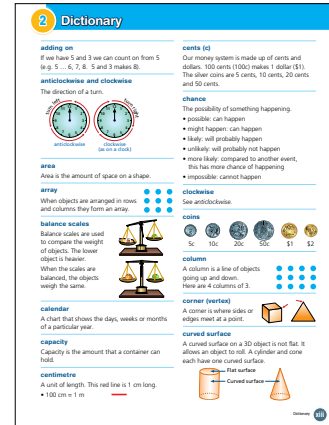
● Differentiation

Each student work page has a Teacher Resource page to support it. Cross-references direct the teacher to pages where the concept is introduced and developed. These references may be from the Student Book for the previous year, the current year or the next year.

The Teacher Resource support pages provide additional learning activities for students who need remediation or extension activities. The Blackline Masters provide activities to support students of various learning abilities.

● Cartoons

Cartoons are used to motivate and instruct.



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.



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



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.

I'm on the top of each page.



Structure of New South Wales Mathematics 1-6

The NSW Mathematics Syllabus content is presented in three strands:

- 1 Number and algebra
- 2 Measurement and space,
- 3 Statistics and probability.

Working mathematically pervades each of these strands.

The Mathematics syllabus can be found at:

<https://curriculum.nsw.edu.au/learning-areas/mathematics/mathematics-k-10>

Textbook structure

Within the Contents for Year 2, we show related pages using these categories:

Number and algebra

Numbers
Addition / subtraction
Sharing / grouping
Patterns

Measurement and space

2D shapes / 3D objects
Length / area / mass
Capacity / volume
Time / duration
Position

Statistics and probability

Data displays
Chance

2 Contents and syllabus overview

Contents cross-reference xi
 Dictionary xiii
 Identifying and addressing areas of need . . . 142
 Blackline masters 144



KEY

Number and algebra
Measurement and space
Statistics and probability

Strand	Number / algebra	Measurement / space	Statistics / probability	Content area	Numbers	Addition / subtraction	Sharing / grouping	Patterns	2D shapes / 3D objects	Length / area / mass	Capacity / volume	Time / duration	Position	Data displays	Chance
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Page	Unit	Title	Strand	Number / algebra	Measurement / space	Statistics / probability	Content area	Numbers	Addition / subtraction	Sharing / grouping	Patterns	2D shapes / 3D objects	Length / area / mass	Capacity / volume	Time / duration	Position	Data displays	Chance
1	Thinking Skills	Working mathematically pervades each of the strands.																
2	1A	Combinations to 10		●					●									
3	1B	Subtraction to 10		●					●									
4	1C	Position words			●											●		
5	1D	Modelling numbers		●				●										
6	2A	Addition		●					●									
7	2B	Addition to 20		●					●									
8	2C	Addition to 20		●					●									
9	2D	Thinking about groups				●												●
10	3A	Doubling and near doubling		●					●									
11	3B	Sharing		●					●									
12	3C	Sharing		●					●									
13	3D	2D shapes			●							●						
14	4A	Subtraction		●					●									
15	4B	Subtraction to 20		●					●									
16	4C	Ordinal numbers and calendars			●										●			
17	4D	The calendar			●										●			
18	5A	Addition to 20		●					●									
19	5B	Addition by looking for tens		●					●									
20	5C	Looking at 3D objects			●							●						
21	5D	Describing 3D objects			●							●						

Progress test 1: Administer test (Teacher Resource, pages xxx-xxx) then address weaknesses.

22	6A	Sharing and grouping		●					●									
23	6B	Groups and rows		●					●									
24	6C	Revision of time			●										●			
25	6D	Estimating time passed			●										●			
26	7A	Groups and rows		●					●									
27	7B	Problem solving		●					●									
28	7C	Features of 2D shapes			●							●						
29	7D	Drawing 2D shapes			●							●						

KEY

	Number and algebra
	Measurement and space
	Statistics and probability

Page	Unit	Title	Strand	Content area			Numbers	Addition / subtraction	Sharing / grouping	Patterns	2D shapes / 3D objects	Length / area / mass	Capacity / volume	Time / duration	Position	Data displays	Chance
				Number / algebra	Measurement / space	Statistics / probability											
30	8A	Subtraction to 20					●										
31	8B	Differences					●										
32	8C	Balance scales										●					
33	8D	Comparing masses										●					
34	9A	Linking addition and subtraction					●										
35	9B	Linking addition and subtraction					●										
36	9C	Informal units of length										●					
37	9D	Informal units of length										●					
38	10A	How many more?					●										
39	10B	Volume and capacity											●				
40	10C	Using graphs														●	
41	10D	Chance															●
42	11A	Adding 10s					●										
43	11B	Adding and subtracting 10s					●										
44	11C	Ordering capacities										●					
45	11D	Lists, graphs and tables														●	
46	12A	Inverse operations					●										
47	12B	Australian money					●										

Progress test 2: Administer test (Teacher Resource, pages xxx–xxx) then address weaknesses.

48	12C	Halves / quarters						●									
49	12D	Fractions of a group						●									
50	13A	Equal groups						●									
51	13B	Equal groups						●									
52	13C	Analog time												●			
53	13D	Analog time												●			
54	14A	Using skip counting						●									
55	14B	Number lines					●	●									
56	14C	Digital time												●			
57	14D	Analog time												●			
58	15A	Using arrays						●									
59	15B	Arrays						●									
60	15C	Problem solving						●									
61	15D	Chance															●
62	16A	Numbers to 150					●										
63	16B	Numbers to 1000					●										
64	16C	Informal units of length										●					
65	16D	Telling the story from data														●	

KEY

Number and algebra
Measurement and space
Statistics and probability

Page	Unit	Title	Strand	Number / algebra	Measurement / space	Statistics / probability	Content area	Numbers	Addition / subtraction	Sharing / grouping	Patterns	2D shapes / 3D objects	Length / area / mass	Capacity / volume	Time / duration	Position	Data displays	Chance
66	17A	Numbers to 1000		●				●										
67	17B	Numbers to 1000		●				●										
68	17C	Informal units of length			●								●					
69	17D	The metre			●								●					
70	18A	Numbers to 1000		●				●										
71	18B	Number patterns		●						●								
72	18C	Centimetres			●								●					
73	18D	Measuring with centimetres			●								●					
74	19A	Number patterns		●						●								
75	19B	Counting by tens		●				●										
76	19C	Comparing areas			●								●					
77	19D	Area			●								●					
78	20A	Numbers		●				●										
79	20B	Rounding to the nearest ten		●				●										
80	20C	Area using informal units			●								●					
81	20D	Area of a rectangle			●								●					
82	21A	Value of coins		●				●										
83	21B	Money		●				●										

Progress test 3: Administer test (Teacher Resource, pages xxx–xxx) then address weaknesses.

84	21C	Duration using hours			●										●			
85	21D	Duration using weeks			●										●			
86	22A	Amounts to \$2		●				●										
87	22B	Value of coins		●				●										
88	22C	Prisms and cylinders			●							●						
89	22D	3D objects			●							●						
90	23A	Building to the next 10		●				●										
91	23B	Building to the next 10		●				●										
92	23C	Volume			●									●				
93	23D	Comparing volume			●									●				
94	24A	Split strategy (addition)		●				●										
95	24B	Split strategy (addition)		●				●										
96	24C	Ordering masses			●								●					
97	24D	Balance scales			●								●					
98	25A	Rounding to the nearest 100		●				●										
99	25B	Building to the next 10		●				●										
100	25C	Turning a shape			●							●						
101	25D	Turning shapes			●							●						

KEY

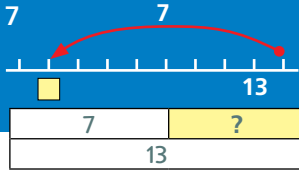
Number and algebra
Measurement and space
Statistics and probability

Page	Unit	Title	Strand	Number / algebra	Measurement / space	Statistics / probability	Content area	Numbers	Addition / subtraction	Sharing / grouping	Patterns	2D shapes / 3D objects	Length / area / mass	Capacity / volume	Time / duration	Position	Data displays	Chance
102	26A	Using rows		●						●								
103	26B	Using groups		●						●								
104	26C	Adding columns		●						●								
105	26D	The cube			●							●						
106	27A	Jump strategy (addition)		●					●									
107	27B	Jump strategy (subtraction)		●					●									
108	27C	Giving directions			●											●		

Progress test 4: Administer test (Teacher Resource, pages xxx–xxx) then address weaknesses.

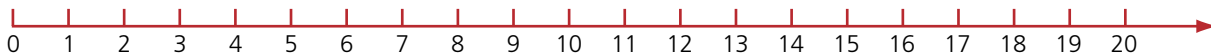
109	27D	Using tally marks				●												●
110	28A	Jump strategy (subtraction)		●					●									
111	28B	Fractions of a group		●						●								
112	28C	Eighths of a length			●							●						
113	28D	Making graphs				●												●
114	29A	Doubling and halving		●					●									
115	29B	Doubling and halving		●					●									
116	29C	Duration of time			●										●			
117	29D	Gathering data				●												●
118	30A	Problem solving		●						●								
119	30B	Problem solving		●						●								
120	30C	Combine and separate shapes			●							●						
121	30D	Following instructions			●											●		
122	31A	Repeated subtraction		●						●								
123	31B	Fractions of a whole			●								●					
124	31C	Fractions			●								●					
125	31D	Metres and centimetres			●								●					
126	32A	Choosing a strategy		●					●									
127	32B	Choosing a strategy		●					●									
128	32C	Quarter turns			●							●						

Progress test 5: Administer test (Teacher Resource, pages xxx–xxx) then address weaknesses.



8A

Subtraction to 20



1 Complete these by counting on or counting back.

a

b

c

Subtracting zero is easy.
 $10 - 0 = 10$



2 Colour the boxes. 10 = red, 9 = blue, 8 = green, 7 = yellow

14 - 4	13 - 4	9 - 2	13 - 6	11 - 4	16 - 7	20 - 10
12 - 3	15 - 5	14 - 5	12 - 5	15 - 6	19 - 9	17 - 8
11 - 3	12 - 4	16 - 6	18 - 10	18 - 8	14 - 6	16 - 8
8 - 1	15 - 7	18 - 9	17 - 7	11 - 2	10 - 3	13 - 5

3 Use this code to find the message.

A	E	H	I	K	L	M	S	T
8	6	2	3	9	4	5	7	10

$10 - 7 = \square$

Ask:
7 plus what makes 10?

$7 + \square = 10$



Message:

10 - 7	12 - 8	9 - 6	11 - 2	10 - 4
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

8 - 3	9 - 1	10 - 0	7 - 5	9 - 2
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Make a message of your own using the code.

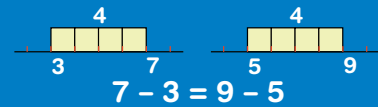
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

FUN SPOT

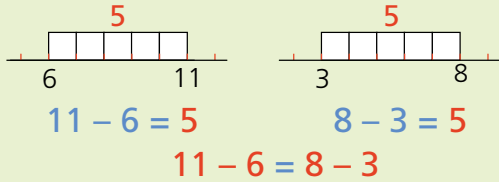




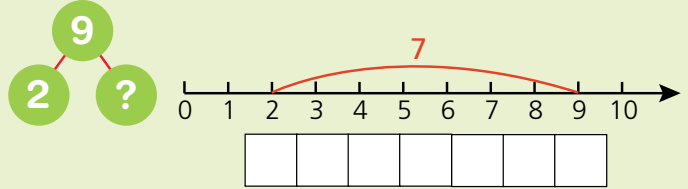
The difference between 3 and 7 is the same as between 5 and 9.



A Is the difference between 11 and 6 the same as between 8 and 3? **yes**



B Finding the difference
The difference between 9 and 2 = **7**



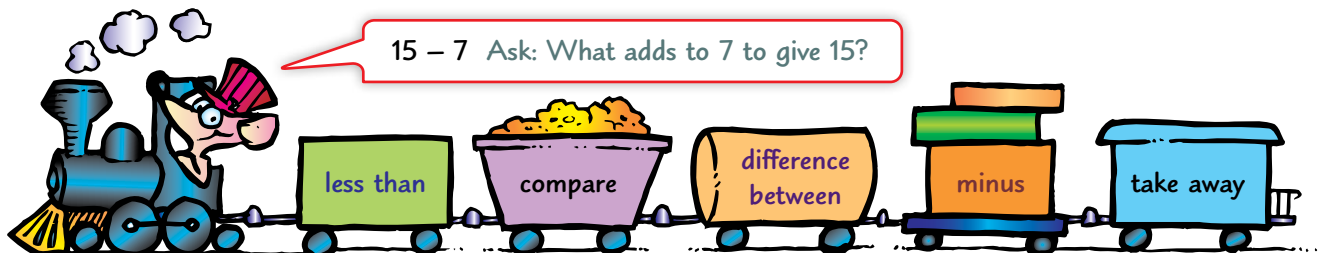
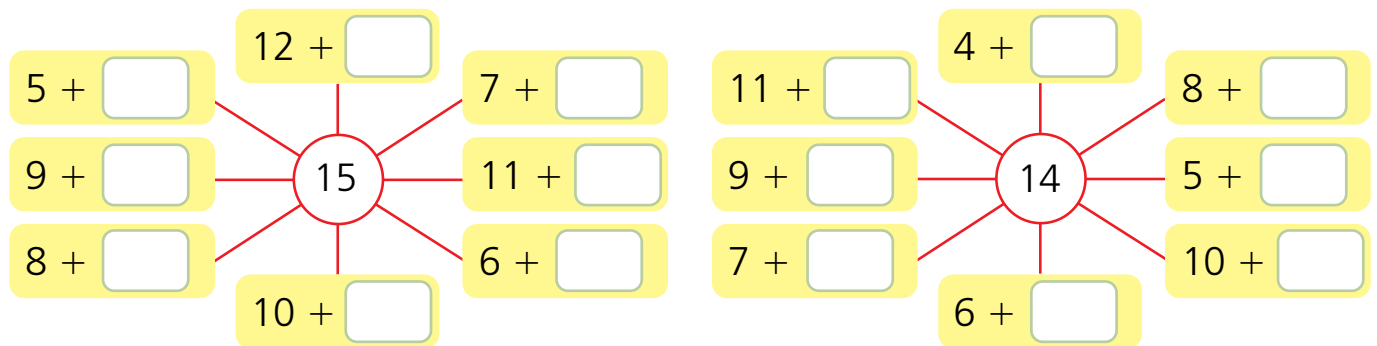
- a** The difference between 10 and 6 =
- b** The difference between 15 and 8 =
- c** The difference between 12 and 6 =



- 2 a** Is the difference between 7 and 4 the same as between 17 and 14?
- b** Is the difference between 8 and 5 the same as between 16 and 13?
- c** Is the difference between 12 and 8 the same as between 11 and 15?
- d** Is the difference between 19 and 17 the same as between 8 and 6?

Sample Pages

3 Fill in the diagram using addition facts.





Use hefting to estimate.



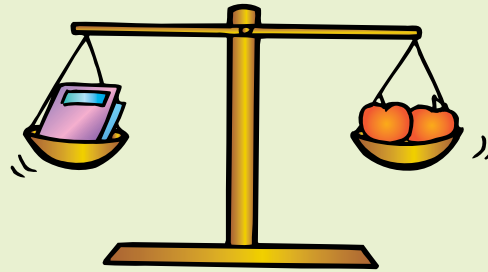
CONCEPT



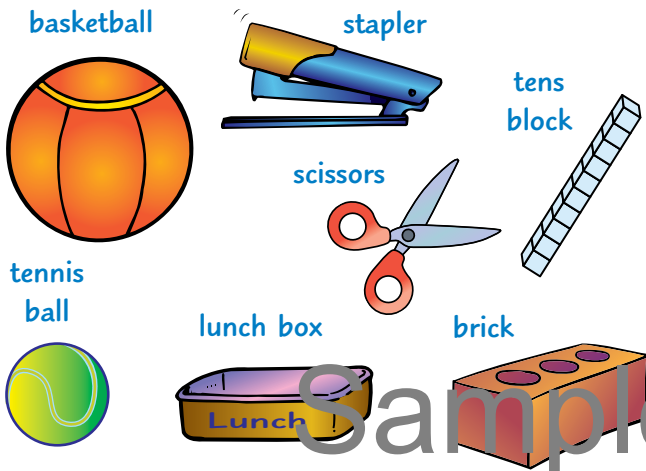
Using scales is like hefting.
The scales are **balanced**.

One book balances apples.

Two books balance apples.




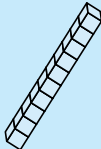

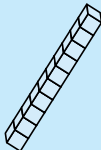
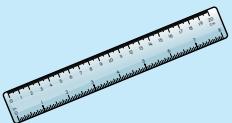
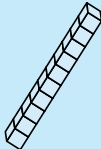
1 Which objects are lighter or heavier than a maths textbook?



Lighter	Heavier

Sample Pages

Estimate, then balance and record.

Object	Unit of measure
 cup <input type="text"/>  tens blocks	
 scissors <input type="text"/>  tens blocks	
 ruler <input type="text"/>  tens blocks	

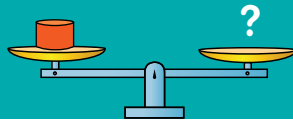
Which of the three objects was heaviest?

Find an object that has nearly the same mass as a cup.

Would you need more ones blocks or tens blocks to balance a cup?

Discuss why.





Why would I need more ones blocks than marbles?



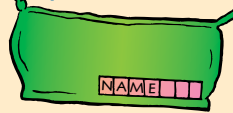
ACTIVITY



1 a Handle two objects like these and **estimate** which one is heavier.

I estimate the to be

pencil case



heavier than the .

b Use blocks and a balance scale to find the mass of each object. (You could use marbles as a unit.)

The has a mass equal to marbles.

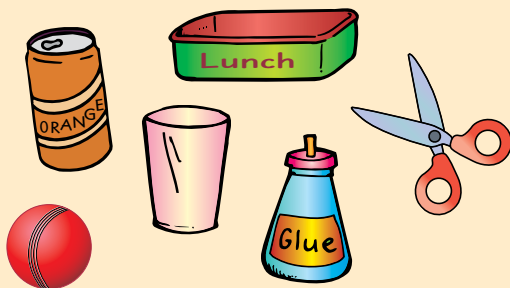


The has a mass equal to marbles.



2 Choose three pairs of objects in the classroom.

- Estimate which object is heavier in each pair by hefting.
- Check by using a balance scale and marbles.
- Complete this chart.



Estimate by hefting	Number of units	Was your estimate correct?
<input type="text"/> is heavier than <input type="text"/>	<input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="text"/> is heavier than <input type="text"/>	<input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="text"/> is heavier than <input type="text"/>	<input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No

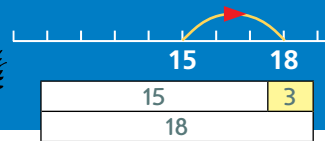
Estimating mass

Choose two objects. Estimate (guess) what their mass would be using marbles. Use a balance scale to measure. How close were your estimates?

INVESTIGATION



Object	Estimate	Real mass	Difference
<input type="text"/>	<input type="text"/> marbles	<input type="text"/> marbles	<input type="text"/> marbles
<input type="text"/>	<input type="text"/> marbles	<input type="text"/> marbles	<input type="text"/> marbles

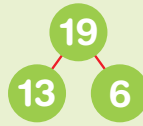
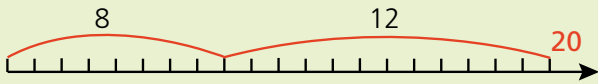


If $8 + 12 = 20$ then $12 + 8 = 20$

8	12
20	

$20 - 8 = 12$

$20 - 12 = 8$

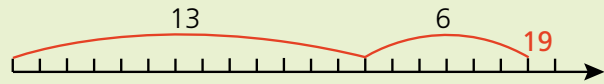


$13 + 6 = 19$

$6 + 13 = 19$

$19 - 6 = 13$

$19 - 13 = 6$



CONCEPT

These are linked.

1 a If $7 + 15 = 22$ then $15 + 7 =$

7	15
22	

$22 - 7 =$

$22 - 15 =$

$7 + 15 =$

b $9 + 8 =$



$8 + 9 =$

$17 - 9 =$

$17 - 8 =$

2 Use the pictures to help fill in the missing numerals.

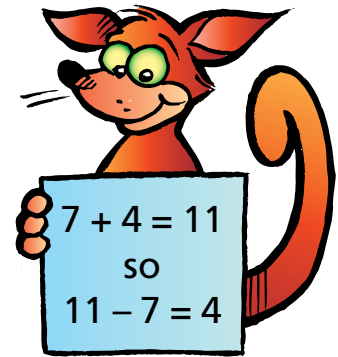
a



+	=
+	=
+	=
+	=



+	=
+	=
+	=
+	=

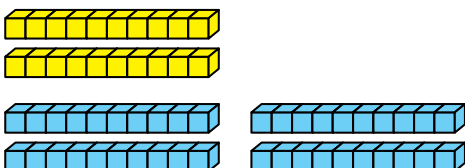


3 Write two addition and two subtraction facts for this picture.



+	=	-	=
+	=	-	=

4 Write two addition and two subtraction facts for this picture.



+	=	-	=
+	=	-	=



12	8
20	



Addition and subtraction are linked.

$6 + 4 = 10$



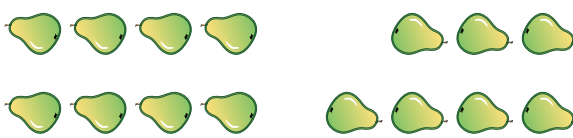
so $10 - 6 = 4$ and $10 - 4 = 6$




$12 + 8 = 20$ $\begin{cases} 20 - 8 = 12 \\ 20 - 12 = 8 \end{cases}$

1 Write two linking subtraction number sentences for each addition.


a $8 + 7 = 15$



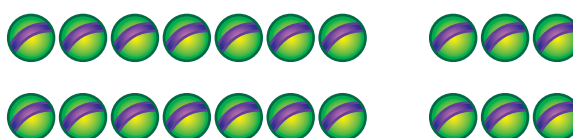
b $6 + 8 = 14$




c $7 + 5 = 12$




d $14 + 6 = 20$



e $22 + 9 = 31$



f $17 + 9 = 26$



Sample Pages

Make linked number sentences of your own.

+ =

- =

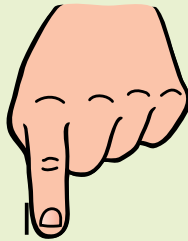
- =



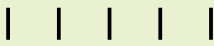


How many times will the width of my finger fit along my pencil?

finger widths



widths



1 Use the object named as a measuring unit to find the length of your pencil.

Unit used	Length of a pencil
place-value ones blocks	<input type="text"/> blocks
paperclips	<input type="text"/> paperclips
finger widths	<input type="text"/> finger widths



2 Use hand spans to measure the length of:

- a this book
- b a bag
- c a window
- d your arm.

Guess

Check

Sample Pages



Order these lengths from shortest to longest.

Estimate then measure how many steps from where you are to:



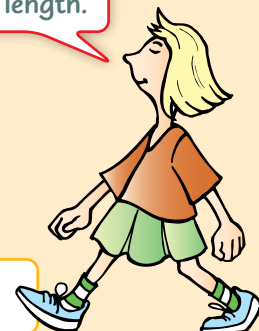
- a the school canteen
- b the lunch seats
- c the library.

Guess

Check

Each step should be the same length.

Order these distances from shortest to longest.





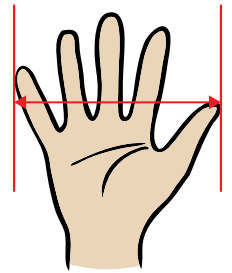
- 1 Use the object named as a measuring unit to find the length of your desk.

Unit used	Length of your desk
this book	<input type="text"/> books
a pencil	<input type="text"/> pencils
finger lengths	<input type="text"/> fingers



- 2 Use your hand span to measure the length of each object.

Your desk	<input type="text"/> hand spans
Teacher's desk	<input type="text"/> hand spans
Cupboard	<input type="text"/> hand spans
Door	<input type="text"/> hand spans

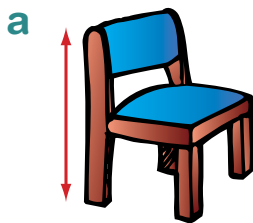


Which is longer?

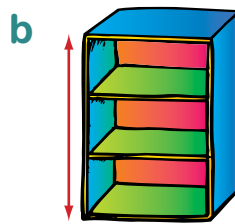
Which is shorter?

Sample Pages

- 3 Estimate, then use craft sticks to measure these lengths.



Estimate sticks
Measure sticks



Estimate sticks
Measure sticks



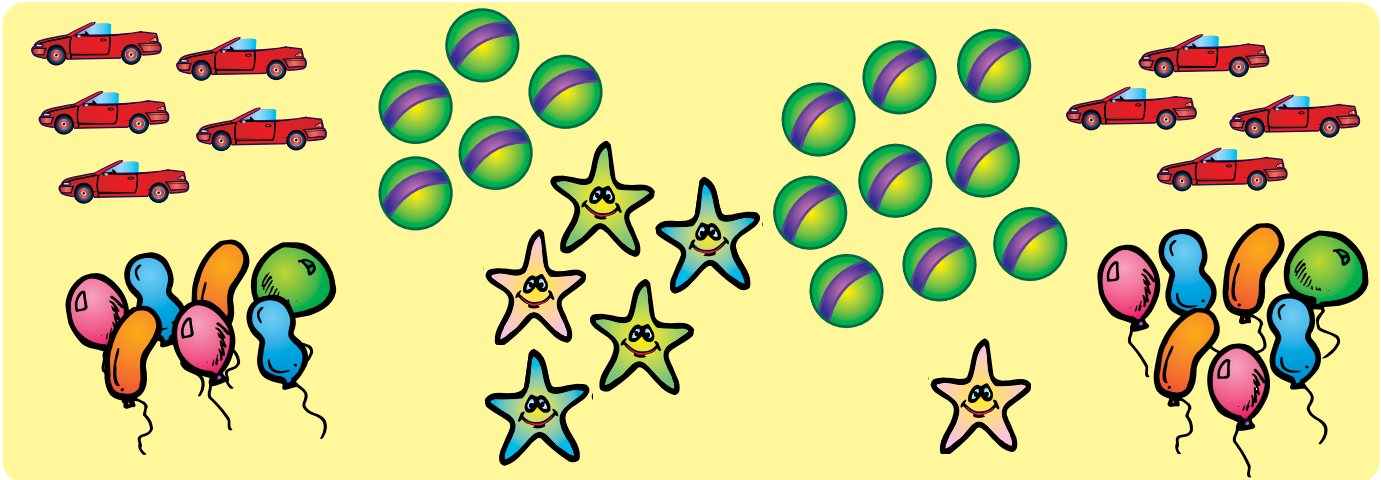
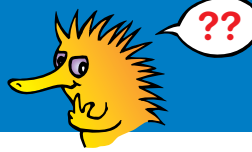
Estimate sticks
Measure sticks

Use string to compare the length of objects in the room.

is longer than .

is longer than .





1 In this picture, how many more would I need to make 20:

a cars? $5 + 4 + \quad = 20$

b balloons? $\quad + \quad + \quad = 20$

c balls? $\quad + \quad + \quad = 20$

d starfish? $\quad + \quad + \quad = 20$

2 a $6 + \quad = 12$

b $3 + 8 + \quad = 16$

c $11 + \quad = 15$

d $4 + \quad + 5 = 13$

e $\quad + 9 = 13$

f $10 + \quad + 5 = 19$

g $5 + \quad = 12$

h $8 + 9 + \quad = 20$

i $\quad + 8 = 16$

j $7 + 3 + \quad = 20$

Sample Pages

Describe how you found the missing number.



INVESTIGATION

List all possible answers.

a $6 + \quad + \quad = 10$

$6 + \quad + \quad = 10$

$6 + \quad + \quad = 10$

$6 + \quad + \quad = 10$

$6 + \quad + \quad = 10$

b $17 + \quad + \quad = 20$

$17 + \quad + \quad = 20$

$17 + \quad + \quad = 20$

$17 + \quad + \quad = 20$

Does $2 + 1 = 1 + 2$? Discuss.



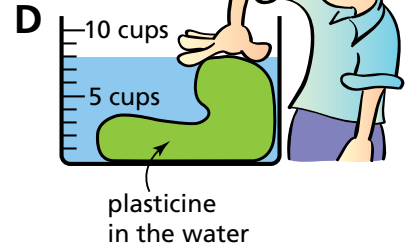
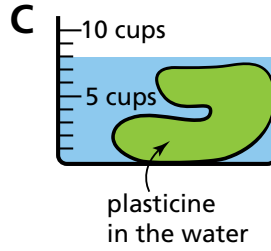
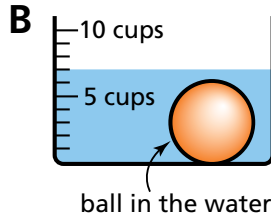
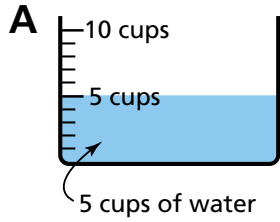
Explore possible answers for $10 + \quad + \quad = 20$.



To find which holds more, pour the contents of one into the other.



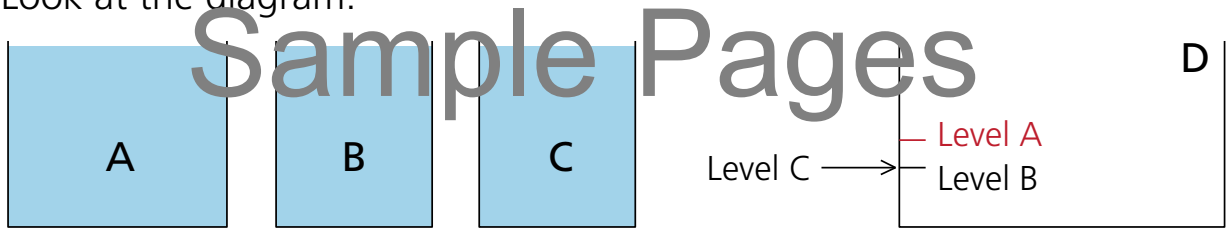
1 Dipping into water:



- a What is the volume of the ball?
- b What is the volume of two balls?
- c What is the volume of the plasticine in C?
- d What is the volume of the plasticine in D?
- e Could the plasticine in C and D be the same?

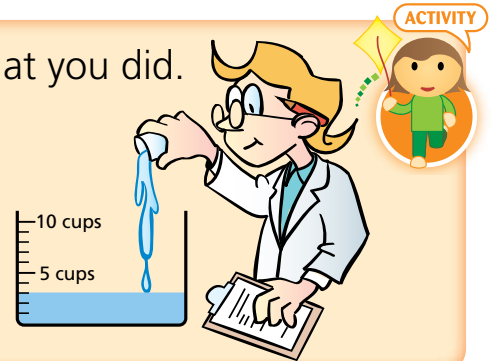
cups
 cups
 cups
 cups

2 Look at the diagram.



- a If the water in A is poured into B, would it overflow?
When the water from A is poured into D it reaches Level A.
- b Does container B have the same capacity as container A?
- c Which container has the same capacity as container C?
- d Which container has the greatest capacity?

Carry out one of the experiments above. Record what you did.

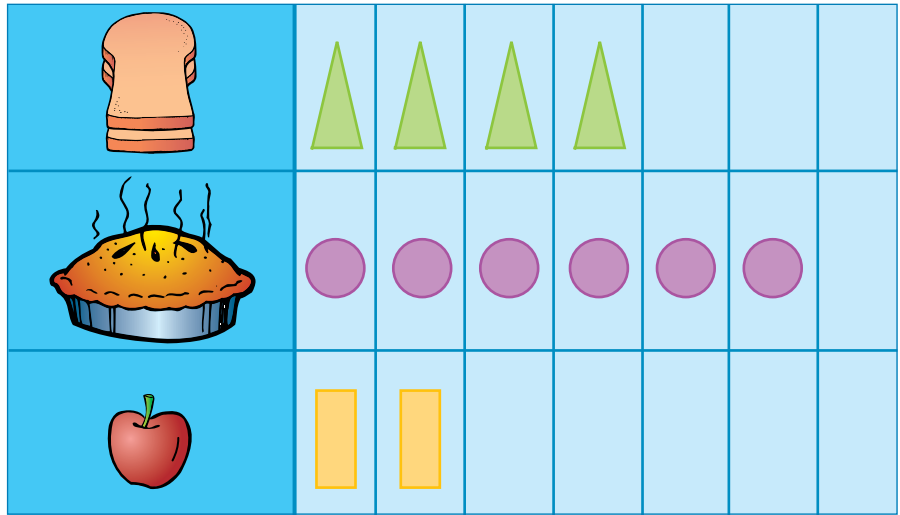




1 How many:

Food in the classroom

- a sandwiches?
- b pies?
- c apples?
- d altogether?
- e more pies than apples?



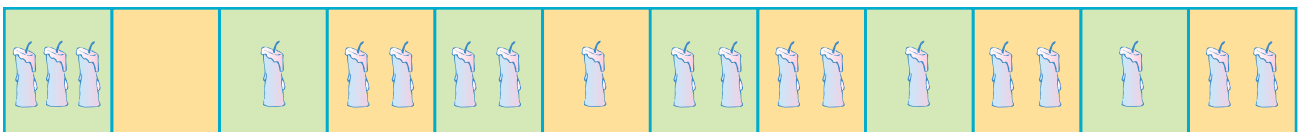
f Complete the table below to show the food in the classroom.

g What other foods could be in a classroom?

Food in the classroom	
Sandwiches	
Pies	
Apples	

Sample Pages

2 Each student put a candle above their month of birth to make this graph.



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

How many students were born in:

- a January?
- b November?
- c February?
- d How many students were there altogether?

Discuss how your class could find out:

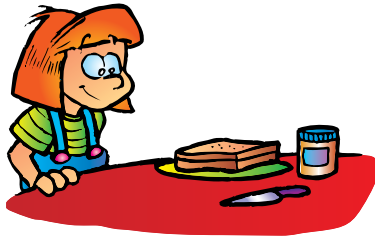
- the most popular colours of the cars passing the school.
- the number of each colour in a box of Smarties (or M&Ms).





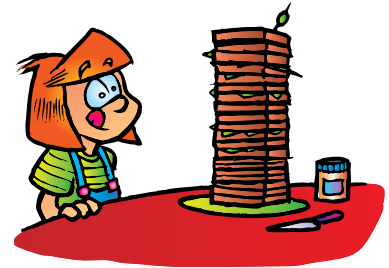
1 Link each event with the better label.

a



more likely

less likely



b



more likely

less likely



c



more likely

less likely



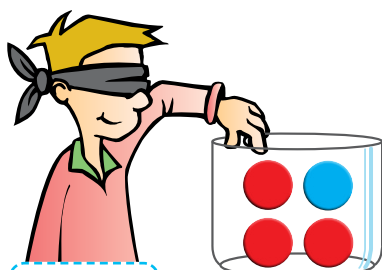
Sample Pages

2 Complete this sentence.

It is more likely that I will

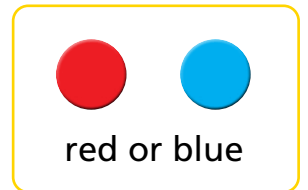
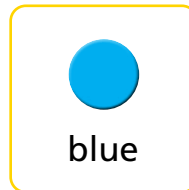
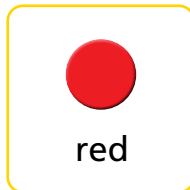


3 Sam will take out one counter. Match the boxes.



Certain means it must happen.

3 red
1 blue



impossible

likely

certain

unlikely

Australian



Signpost **NSW**

MATHS

Sample Pages



Teacher Resource

Alan McSeveny

Erika Johnson

Rachel McSeveny

Alan Parker

Diane McSeveny-Foster

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Sample Pages

N.B. Many of the BLMs can be laminated and used over and over again by students.

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Sample Pages

N.B. The Consolidation Booklet can be used when students finish early or when they have minimal supervision.

Introduction

About Australian Signpost Maths NSW

Australian Signpost Maths NSW has been written to meet the requirements of the NSW Mathematics Primary Syllabus (K–6).

A Student Book and an online Teacher Resource are provided for the Kindergarten (Early Stage 1) year. For Years 1–6 (Stages 1–3), a Student Book, an online Teacher Resource and a Mentals Book are provided.

The website, Pearson Places, is where you will find the online Teacher Resource. Together these resources provide a complete and fully integrated learning program. The structure of the program supports thorough and imaginative classroom teaching.

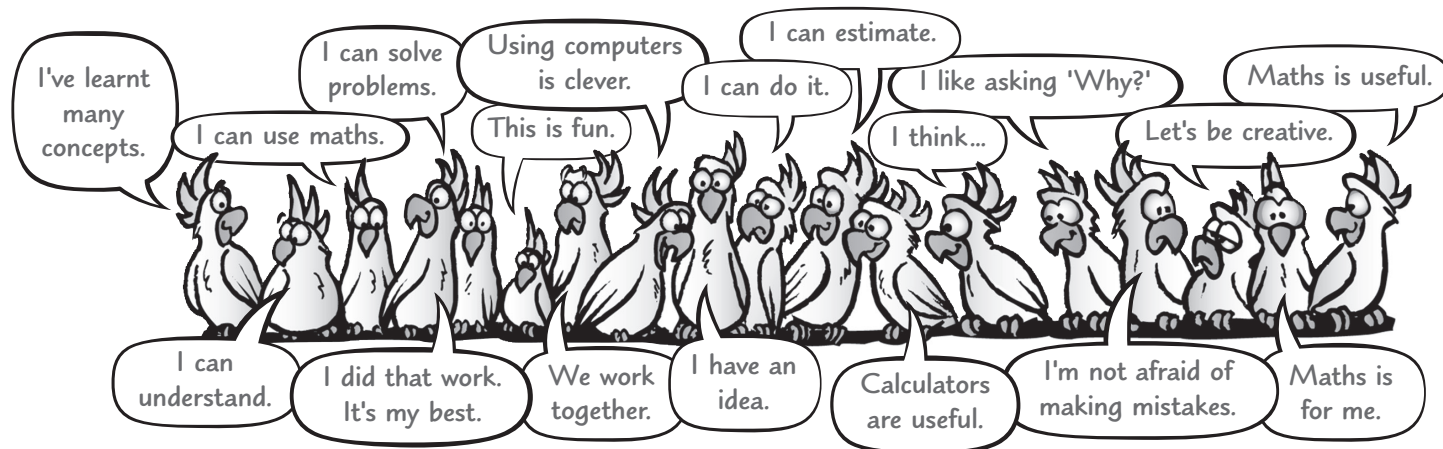
Aims of the Signpost Maths series

Our aim is to provide the very best set of resources possible to help students reach their full potential and gain confidence and a love of mathematics.

The Signpost program has been designed to facilitate:

- explicit teaching and a sound foundation of knowledge and skills
- working through carefully sequenced developmental steps in each aspect of the syllabus
- developing concepts by using concrete materials and real-life experiences
- involving students in cooperative group work posing, constructing and solving problems as an integral part of teaching
- developing language and extending vocabulary
- recognising the importance of evaluation and consequent remediation
- extending more capable students
- engaging students with technology as a tool for understanding concepts and developing skills
- motivation of students through creative illustrations and cartoons.

Sample Pages



Features of Australian Signpost Maths NSW

The Student and Teacher's Resource

In Student Books for Kindergarten, Year 1 and Year 2, pages are presented in the intended teaching order to allow students to work through the book from the beginning to the end. In Student Books for Years 3 to 6, the pages are organised in sections, reflecting the strands of the syllabus. This allows more teaching flexibility in programming.

Answers

The Answers for Student Book pages are provided on the Teacher Resource pages in this book (see pp 1–141).

Teacher Resource pages

The Teacher Resource pages (pp 1–141) provide syllabus references, notes about the student page, additional teaching activities, extension work, language, resources needed for the lesson, cross-references, evaluation and answers for each page of the Student Book.

Student Book Contents

The Student Book Contents are duplicated on pp 000–000 of this resource. They include a suggested order and summarise the content addressed during each term.

Content cross-reference

This is found on pp xxiii–xxiv of the Student Book and pp xxvi–xxviii of the Teacher's Book. This shows the pages of the Student Book that address the important themes of the syllabus. The content cross-reference can be used to construct programs, treat weaknesses after testing and direct students to work that will remediate or extend.

Progress tests and retests

Diagnosis and treatment of weaknesses is essential.

Identify areas where a student's memory is fading and discover concepts missed or not understood. Testing is of great value when you use the test results to help the student master the concepts. Revise / reteach areas of weakness that are discovered to remove barriers to future learning of related concepts. When teaching new concepts and skills, it is important to build a strong foundation.

Progress tests 1 to 5 are found on pp 000–000 and Progress retests are found on pp 000–000 of this

resource. After each test, *notes* and *answers* are supplied. Progress test questions are cross-referenced to appropriate Student Book pages. These cross-references are found on the Remediation records pages (pp 000–000 for the Progress tests and pp 000–000 for the Progress retests) and on the Notes and answers pages for each test.

The Remediation record pages are used to provide a record of each student's progress. These are found on pp 000–00 (for the Progress tests) and pp 000–000 (for the Progress retests). For each error recorded, the question should be explained, practice should occur (using the page given in the Student Book cross-reference provided) and retesting should take place using the retest question related to the weakness addressed. An example of the Progress test is given on p viii of this resource. A checklist of skills for Stage 1A is provided on p 000 for teachers who would like to record students' understanding of the syllabus.

Summary

1. Test recent work.
2. Enter mistakes in the Remediation records.
3. Use this to direct your revision / reteaching.
4. Use the matching retest questions to ensure understanding.

Dictionary

A dictionary of important mathematical terms is provided on pp 000–000 of the Student Book.

Blackline masters (BLMs)

A collection of Blackline masters is provided on pp 181–200. Advice for the best use of these BLMs is found throughout the teacher resource pages.

Signpost Year 2 Consolidation booklet

These worksheets are designed to reinforce work completed in class. They provide practice of important skills and addition and subtraction number facts. The booklet can be used when students or the class have limited supervision or when students finish early. It can provide meaningful work and addition tables review.

Progress tests and retests

Here is an example of a Year 2 Progress test. More information about the Progress tests and retests can be found on page vii of this resource.

Progress test 1

Progress test 1 Name: _____

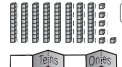
Covering pages 1 to 21

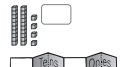
Number and algebra


1 a $2 + 6 = \square$ b $3 + 7 = \square$ c $5 + 1 = \square$

2 a $10 - 6 = \square$ b $8 - 8 = \square$

3 Write the number modelled.

a  \square

b  \square

c  \square

4 Show 3 + 6 on the number line.

$3 + 6 = \square$

5 Write 4 different number sentences.

$\square + \square = 14$


$\square + \square = 14$

$\square + \square = 14$

$\square + \square = 14$

6 Share 8 counters between 2 groups.

One share = \square

7  \square

a How many stars? \square

b How many shares? \square

c How many stars in each share? \square

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Progress test 1 (continued)

Covering pages 1 to 21

8 Show 12 - 7 on the number line.

$12 - 7 = \square$


9 a I had 12 pencils but I lost 5 of them. How many do I have left? \square pencils

b Dom has 8 stickers. Pam has 4. How many do they have altogether? \square stickers

10 a Archer had 3 cars. He got 2 more from Toby and 4 more from Jake. How many cars does he have altogether? $\square + \square + \square = \square$

b Elijah got 3 balls from Mum, 4 balls from Dad and 5 balls from Leo. How many balls did he get altogether? $\square + \square + \square = \square$

Measurement and space

11  In this picture, how many of each shape are there?

a pentagons \square

b quadrilaterals \square


c hexagons \square

12 In what position is the kangaroo that is wearing a hat? \square

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Progress test 1 (continued)

Covering pages 1 to 21

13  Circle the correct description for each.

a The gram is under/beside/above the child.


b The car is in front of/behind/between the house.


c The road is underneath/behind/in front of the house.


d The house is between/inside/on top of the hills.


e The bush is to the left/right/centre of the child.


14 Name and describe each 3D object.


a  \square

b  \square

c  \square

d  \square

e  \square

f  \square

15 **FEBRUARY**

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

a Colour 13th February.

b Tick the third Friday.

c How many Sundays are in this month? \square

d How many weeks it is from 13th February to the 27th February? \square

e How many days it is from 3rd February to the 21st February? \square

f What is the date of the last Saturday in February? \square

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Notes and answers for Progress test 1 Remediation records: Progress tests

Notes and answers for Progress test 1

Covering pages 1 to 21

Objective

- Diagnose weaknesses for future treatment.

Follow-up

- Any weakness discovered should be treated. Copies of Student Book pages are cross-referenced for follow-up.
- Questions and Student Book pages are cross-referenced on the Remediation records: Progress tests pages.
- A record of each student's progress can be kept using the Remediation records: Progress tests pages (see pp 145–146).
- The content of the tests should be revised and reinforced throughout the year where possible. When teaching new concepts and skills, it is important to build on previously known work.



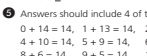
Question topic cross-reference

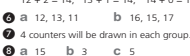
1 Addition	p 2
2 Subtraction	p 3
3 Whole numbers	p 5
4 Addition	pp 6, 8
5 Addition	pp 7, 8, 18
6 Addition	p 10
7 Division	p 11
8 Multiplication and division	p 12
9 Subtraction	p 14
10 Addition and subtraction	p 15
11 Addition	p 18
12 Addition	p 19
13 Addition	p 19
14 2D shapes	p 13
15 Position	p 16
16 Position	p 4
17 3D objects	pp 20, 21
18 Time	pp 16, 17

Progress test 1 answers

1 a 8 b 10 c 6

2 a 4 b 0

3 a 86  b 24  c 95 

4  $3 + 6 = 9$

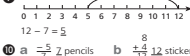
5 Answers should include 4 of these.

$0 + 14 = 14$, $1 + 13 = 14$, $2 + 12 = 14$, $3 + 11 = 14$, $4 + 10 = 14$, $5 + 9 = 14$, $6 + 8 = 14$, $7 + 7 = 14$, $8 + 6 = 14$, $9 + 5 = 14$, $10 + 4 = 14$, $11 + 3 = 14$, $12 + 2 = 14$, $13 + 1 = 14$, $14 + 0 = 14$.

6 a 12, 13, 11 b 16, 15, 17

7 4 counters will be drawn in each group. 1 share = 4

8 a 15 b 3 c 5

9  $12 - 7 = 5$

10 a $\frac{1}{2}$ pencils b $\frac{1}{2}$ 12 stickers

11 a $3 + 2 + 4 = 9$ b $3 + 4 + 5 = 12$

12 a 15 b 18 c 18

13 a T b T

14 a 1 b 5 c 3

15 6th

16 a beside b in front of c behind d between e left

17 a cone: answers may include: 1 flat surface, 1 curved surface, 1 edge, rounded, flat, pointed, cone-shaped, can slide, can roll.

b cylinder: answers may include: 2 flat surfaces, 1 curved surface, 2 edges, rounded, flat, can-shaped, can slide, can roll, can stack.

18 a and b

February						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

c 4 d 2 e 18 f 25th February

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Cross-references Answers

Remediation records: Progress tests

Name: _____ Class: _____

The Student Book page reference shows the page in the Student Book that introduces the example type. Errors made are marked as . When remediation has occurred, mark as .

Progress test 1

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Student Book page	2	3	5	6, 8, 7, 8, 18	10	11	12	14	15	18	19	19	13	16	4	20, 21	16	17
Errors made																		

Questions covering each topic area

Number and algebra:	Whole numbers: 3	Addition and subtraction: 10	Measurement and space:	2D shapes: 14
	Addition: 1, 4, 5, 6, 11, 12, 13	Division: 7		Position: 15, 16, 3D
	Subtraction: 2, 9	Multiplication and division: 8		objects: 17
	Time: 18			

Progress test 2

Question	1	2	3	4	5	6	7	8	9	10	11
Student Book page	22	22	23	26, 27	30	31, 38	34	42	46	47	24
Errors made											

Questions covering each topic area

Number and algebra:	Whole numbers: 8, 10	Addition and subtraction: 6, 7, 8, 9	Subtraction: 5
	Division: 1, 2	Multiplication and division: 3	Multiplication: 4
Measurement and space:	2D shapes: 13, 14	Time: 11	Mass: 12
	Chance: 18	Length: 15	Capacity: 16, 17
		Date: 19, 20	

Progress test 3

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Student Book page	48	49	51	49	50, 60	59	54	55	58	62, 63, 66, 70	66	70	71, 74, 75	71	71	78
Errors made																

Question	17	18	19	20	21	22	23	24	25	26	27	28	29
Student Book page	79	147	82	83	52	64	68	69	69, 72, 73	72, 73	77, 80, 81	61	65
Errors made													

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Progress test 1: Remediation records

Using the teacher resource pages

● Page reference and title is the same as in the Student Book.

● Syllabus strand and substrand for the page are identified.

● Content statements and outcomes relevant to the lesson are listed.

● Useful information about the student page is given.

● References to blackline materials are provided in teaching context.

● Activities, Fun Spots and Investigations enrich the learning experience.

● More teaching suggestions are given to support the lesson.

● Student Book page is reproduced.

● Extension work is provided for fast or more capable students.

● Recommended language vocabulary for the lesson is given.

● Resources for all suggested activities are listed.

● Cross-reference allows teacher related pages.

● The lesson's key ideas are identified for evaluation.

● Answers for the Student Book page are provided.

● The Teacher's Book page number is the same as in the Student Book.

Statistics and probability

34B Possible outcomes

➤ **Strand:** Statistics and probability
Substrand: Chance B
Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CHAN-01

➤ **Content:** Identify and describe activities that involve chance

- describe possible outcomes in everyday activities and events as being *likely* or *unlikely* to happen
- compare familiar activities and events and describe them as being *more* or *less likely* to happen
- describe familiar events as being *possible*

➤ **About this page**

- **Header:** Talk about the \$1 coin and the picture on either side. We call the side with the head 'heads' and the other side 'tails', even when that side does not appear to have a tail. This is because the Australian penny, the coin used in the game 'Two up', had a picture of a kangaroo on the 'other' side. The most prominent feature of the kangaroo used on the coin was its tail. Show the class examples of a penny, which was replaced with a 1 cent coin (which is no longer in circulation).
- **Question 1:** The word 'possible' means 'can happen' and refers to events that can happen no matter how unlikely they are (e.g. my inflated ball has floated out to sea and I can no longer see it. It is possible that it will float back, but it is highly unlikely).
- **Question 2:** Discuss the answers. A list could be made.
- **Question 3:** Spinners could be made (BLM 32) and the answers checked. Ask, 'How many times will we need to spin the spinner before a pattern emerges?'
- **Question 4:** Once again we could carry out an experiment to check our answers. We could throw a die many times. Discuss the results. Ask, 'Will we ever get the same number of 1s and 6s?' Does that mean that the answer is yes or no?

➤ **Investigation**

- Discuss the experiment. Students should repeat the experiment, but before they do, they should guess how many tosses it will take. Discuss the results. Students could use a tally to keep track of the number of tosses.

➤ **More teaching suggestions**

- Have a class picture talk. Discuss the picture by asking questions in terms of 'chance' vocabulary (e.g. in a zoo scene, ask, 'Is it likely the tigers will escape from their enclosure?'). Encourage students to justify their answers using the language of chance.
- Ask students to use 2 dice and the language of chance to guess how often a certain total will occur (e.g. the dice are unlikely to land on two 6s (12)).

● Provide students with frequent opportunities to use the language of chance (e.g. 'It is unlikely to rain today').

● Toss a coin 10 times and draw the results on the board. Discuss what other results could have occurred.

● Students can practise finding and creating spinners with specified outcomes using the Probability tool.

● Students can use the Probability tool to create jumbler machines. They can use the table to state all the possible outcomes and then watch the trials to informally compare the theoretical and the experimental probabilities.

Extension work ←

- Have 10 students each throw 6 quoits at a target. Predict the number of students who will score 2 hits and compare the prediction with the actual number who scored 2 hits.

Language ←

chance, might, won't, possible, impossible, likely, unlikely, toss, predict, possible outcomes

Resources ←

- coins
- dice
- quoits, target
- large picture (for picture talk)
- BLM: 32 Spinners
- Maths tool: Probability

Cross-reference ←

See also: pp 41, 61
Year 1 pp 81, 128

Evaluation ←

Is the student able to do the following?

- describe possible outcomes in everyday activities and events as being *likely* or *unlikely* to happen
- compare familiar activities and events and describe them as being *more* or *less likely* to happen
- describe familiar events as being *possible*

Answers ←

1 a yes b no c yes

2 a win, lose, draw (In chess, you can have a draw with your opponent.)
b Answers will vary, e.g. sunny, cloudy, rainy, windy

3 a red, blue and green b red
c green d no

4 1, 2, 3, 4, 5, 6; yes

Investigation
Answers will vary.

135

8A Subtraction to 20

Strand: Number and algebra

Substrand: Combining and separating quantities A

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CSQ-01

Content: Use advanced count-by-one strategies to solve addition and subtraction problems

- fluently use advanced count-by-one strategies including counting on and counting back to solve addition and subtraction problems involving 1- and 2-digit numbers

Content: Represent equality

- recall related addition and subtraction facts for numbers to at least 10

Substrand: Combining and separating quantities B

Content: Represent and reason about additive relations

- create, record and recognise combinations of 2 numbers that add to numbers from 11 up to and including 20

About this page

- *Header:* Discuss the diagram and the fact that we can choose from 2 strategies to find the answer.

Strategy 1: We can use the number line by starting at 13 and counting back (subtracting) 7 to give the answer 6.

Strategy 2: We can start at 7 and count on (add 6) until we reach 13. Ultimately students should know their addition facts so well that $7 + 6 = 13$ will come to mind and the answer will be obvious.

Either strategy will give the correct answer provided the procedure is followed correctly.

- In Question 1, remind students that when a number is taken away the answer is less than the number you started with, except when you take away zero, when the number does not change.
- In Question 2, all boxes will be coloured.
- In Question 3, some explanation may be necessary to solve the message.

Fun spot

- 1 Students write a simple message involving 9 letters or less using only A, E, H, I, K, L, M, S and T.
- 2 Write the corresponding numbers in the second row.
- 3 Write a number fact above each number in the second row.

More teaching suggestions

- Use concrete materials to model subtraction. Have the students use numeral cards (BLM 1) and word and symbol cards (BLM 5) to record their number sentences.

- Have students make a stack of 20 Unifix cubes. Taking away 1 cube at a time, they record the subtraction facts using cards or BLM 20.
- In Question 1, once students have completed the page they can check their answers by adding the 2 numbers to ensure they equal the number in the centre (i.e. 10, 13 or 12).
- Place a selection of cards, 1 (ace) to 10, face down in a pile on the desk. Have students work in groups of 3 and take turns to pick up 2 cards at a time. The aim is to practise subtraction. Remind students to take the smaller number from the bigger number. The student with the most correct number of 'pairs' wins.
- For more capable students, have 2 different-coloured dice (e.g. red and blue). Roll the (red) die and add 10 to that number – if a 5 was rolled, 10 would be added to make 15. Roll the (blue) die and take that number away – if a 6 was rolled, it becomes $15 - 6 = 9$. The emphasis is on subtracting mentally. If needed, concrete materials or a number line (BLM 17) could be used.
- Revise counting backwards using the number chart (BLM 2). Vary the starting points.
- Practise subtraction facts (BLM 41 and 42).
- Students can practise subtraction by using a double workspace in the Place value blocks tool. Students should create value in the upper workspace and model subtraction by taking blocks away from the original number and dragging them to the lower workspace.
- Students can demonstrate subtraction using the Number Lines tool. They should extend the line to 20, place an arc on the starting value and then drag the arrow to the left to model the subtraction. Students should write a number sentence to show what they have created using the text button.

Extension work

- Have students make up a code and a message of their own using addition.

Language

counting on, counting back, subtraction, different, difference, what's the difference, more, how many more, remove, take away, left, leaves, what's left, equals, is equal to, code

Resources

- any classroom objects that can be counted (e.g. counters, marbles, shells, buttons, ones blocks, Unifix cubes, Centicubes, plastic coins)
- red, blue, green and yellow pencils
- dice
- decks of cards

Sample Pages

- BLMs: 1 Numeral cards, 2 Number chart, 19 Subtraction webs, 20 Subtracting two groups, 21 Addition and subtraction facts, 41 Subtraction facts to 10, 42 Subtraction facts to 20
- Maths tools: Place value blocks, Number lines

Cross-reference

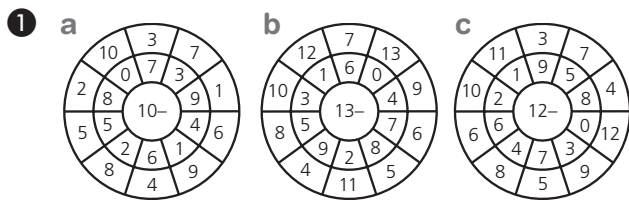
See also: pp 14, 15, 31, 34, 35, 107, 110
Year 1 pp 43, 54, 55, 60, 70, 71, 78

Evaluation

Is the student able to do the following?

- fluently use advanced count-by-one strategies including counting on and counting back to solve subtraction problems involving 1- and 2-digit numbers
- recall related subtraction facts for numbers to at least 10

Answers



- 2 Colour red: $14 - 4$, $20 - 10$, $15 - 5$, $18 - 9$, $16 - 6$, $18 - 8$, $17 - 7$
Colour blue: $13 - 4$, $16 - 7$, $12 - 3$, $14 - 5$, $15 - 6$, $17 - 8$, $19 - 10$, $18 - 9$, $11 - 2$
Colour green: $11 - 3$, $12 - 4$, $14 - 6$, $16 - 8$, $15 - 7$, $13 - 5$
Colour yellow: $9 - 2$, $13 - 6$, $11 - 4$, $12 - 5$, $8 - 1$, $10 - 3$

- 3 I LIKE MATHS

Fun spot

Answers will vary.

Sample Pages

8B Differences

Strand: Number and algebra

Substrand: Combining and separating quantities B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CSQ-01

Content: Represent and reason about additive relations

- create, record and recognise combinations of 2 numbers that add to numbers from 11 up to and including 20
- represent the difference between 2 numbers using concrete materials and diagrams
- represent a constant difference between pairs of numbers
- recall and use related addition and subtraction number facts to at least 20

Content: Use knowledge of equality to solve related problems

- use a variety of ways of writing number sentences

About this page

- *Header:* A diagram is used to help students understand number relationships. Discuss the statement, 'If $7 - 3 = 4$ and $9 - 5 = 4$, then $7 - 3 = 9 - 5$ because they have the same difference.' Encourage students to use diagrams to solve problems.
- Discuss example B in the Concept box. Discuss the use of blocks, the number line and a number bond as ways to find the difference between 9 and 2.
- Talk about the word 'difference' and that it is another way of saying 'take away'.
- *Question 1:* Talk about the fact that every second number (even numbers) is written on the number line but this does not mean that the odd numbers are not used. Students could fill in these numbers to complete the number line. A ruler could also be used as a number line.
- Encourage students to use the number line to answer the questions.
- *Question 2:* Ask students to record the answers to the first and seconds parts of the question so that the differences can be compared and a 'yes' or 'no' written.
- Ask students 'count on', 'count back' or use known addition facts to complete the diagrams. Some students will find it easier to stick to the same process for each question.
- Discuss what you found when filling in the boxes (e.g. $5 + 10$, $10 + 5$, $9 + 6$, $6 + 9$, $7 + 8$, $8 + 7$, double 7).
- Discuss the words listed that mean 'subtraction' (i.e. less than, compare, difference between, minus and take away).

More teaching suggestions

- Provide students with number lines (BLM 17) and have students show the difference between 2 numbers.

Encourage students to explain how they arrived at the answer.

- Use addition and subtraction facts (BLM 21) for practice and testing of number facts.
- Demonstrate creating your own number facts with a specified result, using the Number lines tool. The arrow needs to point to the result, so extend to a length and then move the arc so that it is in the correct position. This concept can be quite challenging.
- Students can use the Number lines tool to find the subtraction facts that give a result of 7 and 8 as shown in Question 3.

Extension work

- Have students make up addition and subtraction examples and show them on an empty number line (BLM 17).

Language

number line, order, subtraction, take away, minus, less than, compare, difference between, remove, how many left, equals, leaves, is equal to

Resources

- any classroom objects that can be counted (e.g. counters, marbles, shells, buttons, ones blocks, Unifix cubes, Centicubes, plastic coins)
- ruler
- BLMs: 17 Number lines, 21 addition and subtraction facts
- Example questions: Number lines
- Maths tool: Number lines

Cross-reference

See also: pp 14, 15, 30, 38
Year 1 pp 70, 71

Evaluation

Is the student able to do the following?

- recall and use related addition and subtraction number facts to at least 20
- use a variety of strategies to solve problems (e.g. counting on, counting back, doubles, near doubles or known addition facts)

Answers

- 1 a 4 b 7 c 6
- 2 a yes b yes c no d yes
- 3 15: $12 + 3$, $7 + 8$, $11 + 4$, $6 + 9$, $10 + 5$, $8 + 7$, $9 + 6$, $5 + 10$
14: $4 + 10$, $8 + 6$, $5 + 9$, $10 + 4$, $6 + 8$, $7 + 7$, $9 + 5$, $11 + 3$

8C

Balance scales

Strand: Measurement and space

Substrand: Non-spatial measure B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-NSM-01

Content: Compare the masses of objects using an equal-arm balance

- use uniform informal units to measure the mass of an object by counting the number of units needed to obtain a level balance on an equal-arm balance
- select an appropriate uniform informal unit to measure the mass of an object and justify the choice
- explain the relationship between the mass of a unit and the number of units needed
- compare the masses of 2 or more objects using the same informal units
- estimate mass by referring to the number and type of uniform informal units used and check by measuring

About this page

- *Header:* Discuss the concept of hefting. Hefting is used to compare masses by lifting one in each hand.
- *Concept box:* Talk about balance scales. The heavier side will go down, which means the lighter side will go up. If the sides have the same mass (or weight), they will be level (balanced). If 1 book balances 2 apples, then 2 books balance 4 apples ($2 + 2 = 4$).
- *Question 1:* Talk about objects being light and heavy. Make a list of objects that can be written under each heading.
- Encourage students to heft objects before using the balance scales.

Activity

- Encourage students to estimate by hefting before using a balance scale to compare the mass of the 3 objects. Discuss the difference between your estimate and the result. This will allow students to develop estimating skills.
- Ensure students record their results so that discussion can take place and answers can be compared.
- Discuss the idea of 'nearly the same'.
- Ensure students record their results so that discussion can take place to compare answers.
- Discuss the idea of 'nearly the same'.

More teaching suggestions

- *Question 1:* Use balance scales to compare the mass of each object to a textbook. Discuss which objects are lighter or heavier than the textbook.
- Provide frequent opportunities for students to use balance scales to compare and order the masses of 2 objects.

- Ask students to discuss their choice of informal unit. Ask, 'Which do you think is the best to use?'
- Have students record the mass of an object by referring to the number and type of informal unit used (e.g. 'The book weighs 20 tens blocks').
- Have students use informal units to estimate and measure the mass of an object on balance scales (e.g. 'The book weighs the same as ten bolts').

Extension work

- Find a collection of objects that approximate the mass of a single object (e.g. '5 books balance the stone', '2 shoes balance the stone').
- Find 2 collections of objects that have the same mass (e.g. 3 bolts and 5 blocks).

Language

light, lighter, heavy, heavier, not as heavy, heft, hefting, balance scales, equal arm balance, balanced, level, even, nearly the same, lopsided, mass, compare, informal units, tens blocks

Resources

- various classroom objects to balance and weigh (e.g. golf ball, stapler, ones blocks, tens blocks, tennis ball, brick, lunchbox, cup, plastic scissors, ruler, books, stone, shoe, bolts)

Cross-reference

See also: pp 33, 96, 97
Year 1 pp 56, 57, 117

Evaluation

Is the student able to do the following?

- compare the masses of 2 or more objects using the same informal units
- use uniform informal units to measure the mass of an object by counting the number of units needed to obtain a level balance on an equal-arm balance

Answers

Concept box

One book balances 2 apples.
Two books balance 4 apples.

- ① Answers will vary.

Activity

- Answers will vary.
- Answers will vary.

- You will need more ones blocks to balance a cup than tens blocks as each tens block has a mass of about 10 ones blocks. However, ones blocks will give a more accurate measure as the tens block cannot be broken up into smaller parts.

Sample Pages

8D Comparing masses

Strand: Measurement and space

Substrand: Non-spatial measure B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-NSM-01

Content: Compare the masses of objects using an equal-arm balance

- use uniform informal units to measure the mass of an object by counting the number of units needed to obtain a level balance on an equal-arm balance
- select an appropriate uniform informal unit to measure the mass of an object and justify the choice
- compare the masses of 2 or more objects using the same informal units
- estimate mass by referring to the number and type of uniform informal units used and check by measuring

About this page

- *Header:* Discuss the question. More ones blocks than marbles are needed because marbles are heavier than ones blocks. The lighter the unit, the more you will need. Conversely, the heavier the unit, the fewer you will need.

Activity

- Revise how balance scales work. If the heavier side goes down, the lighter side goes up. If the sides carry the same mass (or weight), they will be level (balanced).
- Ask students: 'For what purpose do we use balance scales?' (They are used to compare the mass of objects or to measure the mass of an object using a unit of mass such as marbles or grams.)
- Encourage students to estimate before using an equal-arm balance. Discuss the difference between the estimate and the result. This will allow students to develop this skill over time.
- Note: If the unit used is marbles, each marble should have the same mass.
- *Question 2:* Make students aware that balance scales have their limitations. Objects chosen to be weighed should not be too heavy or so big that they won't fit on the scales. Discuss appropriate objects to be used.
- Remind students that hefting is used to compare masses by lifting one in each hand.

Investigation

- Have students work in small groups to encourage the use of the language of mass. Students should estimate, heft and then use a balance scale to compare objects. Compare the estimation to the measure.

More teaching suggestions

- Provide opportunities for students to heft 2 objects to estimate which one is the heavier. Ask students to check estimations by placing 1 object on each end of a set of balance scales. Note, hefting is to compare masses by lifting them with your hands.
- Have students choose 1 unit of measure and use that unit to balance each object in turn. Record the mass of each object. Marbles, blocks or bolts could be used as units. Discuss the results.

Investigation

- Allow students to work in small groups. Students should estimate, use hefting and then use a pan balance.

Extension work

- Provide opportunities for students to experience conservation of mass (e.g. melting ice, rolling dough, cutting a ball of plasticine, squeezing a tube of toothpaste). Here, the mass remains the same.

Language

mass, weigh, weight, pan balance, balance scale, unit of measure, heft, hefting, measure, order, compare, heavier, lighter, about the same, (level) balance, estimate, number of unit

Resources

- various classroom objects to balance, balance scale, and weigh (e.g. balls, blocks, bolts, bottles, Centicubes, cups, golf balls)
- marbles
- balance scales

Cross-reference

See also: pp 32, 96, 97
Year 1 pp 56, 57, 117

Evaluation

Is the student able to do the following?

- compare measurements of mass by hefting
- compare and order 2 or more objects according to mass
- record measurements by referring to the number and type of units used

Answers

- 1 Answers will vary.
- 2 Answers will vary.

Investigation

Answers will vary.

9A

Linking addition and subtraction

Strand: Number and algebra

Substrand: Combining and separating quantities B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CSQ-01

Content: Represent and reason about additive relations

- recall and use related addition and subtraction number facts to at least 20
- model how addition and subtraction are inverse operations using concrete materials, drawings and diagrams
- represent the difference between 2 numbers using concrete materials and diagrams
- create, record and recognise combinations of 2 numbers that add to numbers from 11 up to and including 20

About this page

- 9A (p 34) and 9B (p 35) could be completed in the same lesson.
- *Header:* Place 15 pencils in a pile and 3 more pencils in another pile. Count all of the pencils. Put the number sentence $15 + 3 = 18$ on the board. Switch the piles so that this time there are 3 pencils first and 15 pencils second. Ask students, 'What is different? Does it affect how many pencils there are altogether?' Follow a similar procedure for $18 - 15 = 3$ and $18 - 3 = 15$. Emphasise that if you know 1 of these facts, you actually know 4 facts because they are linked.
- Discuss the Concept box demonstrating each number sentence and how they are linked using the number line and number bond.
- *Question 1a:* Relate the number sentences to the diagram. The diagram is used to help students understand number relationships. Discuss the relationship between addition and subtraction. Encourage students to use these diagrams as a problem-solving strategy when needed.
- *Question 2:* Some students would benefit from using concrete materials such as counters so they can physically manipulate objects to consolidate their understanding of linking addition and subtraction.
- *Question 3:* The groups may not appear obvious to students so they can draw a line between the group of nine stars and seven stars. Similarly in Question 4, a line can be drawn between the 2 tens blocks and the 4 tens blocks.
- Remind students that when we subtract, we take the smaller number away from the larger number (e.g. $15 - 8$ and $15 - 7$).

More teaching suggestions

- The most important use of this relationship is in using a known addition fact to perform subtraction. I can answer $11 - 7$ because I know that $7 + 4 = 11$.

- Ask students to use number bonds (BLM 13 and BLM 18) to make up examples of their own.
- Discuss the relationships like $5 + 3 = 3 + 5$.
- Give students an addition number sentence and ask them to write the related number sentences.
- Have fast workers use subtraction webs (BLM 19) even if they have seen them before.
- Review the use of number lines (BLM 17) to work out subtraction problems to 20.
- Demonstrate the link between addition and subtraction using the Number lines tool. Ask students to create an arc between 8 and 5 and write a true number sentence to explain the diagram. Then ask them to do the same thing on the number line below/above but in a different way.
- Ask students to create a group of 5, 3 and 8 counters on a workspace using the Counters tool. Students should click on the text button to make 4 true number sentences (e.g. $5 + 3 = 8$, $3 + 5 = 8$, $8 - 3 = 5$ and $8 - 5 = 3$).

Extension work

- Have students draw their own pictures and write 4 number sentences relating to each.
- Use subtraction facts to 20 (BLM 21) for further practice.

Language

linked, addition, add, plus, subtraction, take away, minus, remove, how many left, leaves, is equal to, equals, larger number, smaller number, diagram, number bond, tens blocks

Resources

- concrete materials (e.g. pencils, counters, place value ones)
- tens blocks
- BLMs: 13 Number bond houses (blank), 14 Addition webs, 17 Number lines, 19 Subtraction webs, 21 Addition and subtraction facts
- Maths tools: Number lines, Counters
- Maths tool activity: Number lines

Cross-reference

See also: p 35
Year 1 pp 115, 116

Evaluation

Is the student able to do the following?

- recall and use related addition and subtraction number facts to at least 20
- model how addition and subtraction are inverse operations using concrete materials, drawings and diagrams
- use known addition facts to do subtraction problems

AQ: BLM 42 is subtraction facts to 20. Do you mean that or 21 addition and subtraction facts, as listed in the resources?

Sample Pages

Answers

- ① **a** 22, 15, 7, 22 **b** 17, 17, 8, 9
- ② **a** $9 + 5 = 14$, $5 + 9 = 14$, $14 - 9 = 5$, $14 - 5 = 9$
b $7 + 8 = 15$, $8 + 7 = 15$, $15 - 7 = 8$, $15 - 8 = 7$
- ③ $9 + 7 = 16$, $7 + 9 = 16$, $16 - 9 = 7$, $16 - 7 = 9$
- ④ $20 + 40 = 60$, $40 + 20 = 60$, $60 - 20 = 40$,
 $60 - 40 = 20$

Sample Pages

9B Linking addition and subtraction

Strand: Number and algebra

Substrand: Combining and separating quantities B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CSQ-01

Content: Represent and reason about additive relations

- recall and use related addition and subtraction number facts to at least 20

About this page

- *Concept box:* $6 + 4 = 10$ is linked to the subtraction number sentences $10 - 6 = 4$ and $10 - 4 = 6$. Demonstrate this by using books, Multilink cubes or counters. See the previous page, p 34, for more detail.
- *Question 1:* Here, students are asked to give the linked subtraction sentence as opposed to the previous page, where they were required to also provide the alternative addition number sentence.
- Remind students that when we subtract, we take the smaller number from the larger number (e.g. $15 - 8$ and $15 - 7$).
- The most important use of this relationship is in using a known addition fact to perform subtraction. I can answer $11 - 7$ because I know that $7 + 4 = 11$.

Fun spot

- Some students might benefit from using concrete materials and guided instruction to complete this activity.
- Encourage students to make up as many linked number sentences as they can.

More teaching suggestions

- Ask students to use number bonds (BLM 12) or number lines (BLM 17) to make up examples of their own.
- Have students write the 2 subtraction number sentences related to:

a $3 + 5 = 8$	b $1 + 9 = 10$
c $4 + 3 = 7$	d $8 + 7 = 15$
- Use counters and number lines (BLM 17) to show each number sentence above.
- Review addition of numbers by counting on from the larger number.
- Continue to test recall of number facts to 20. Use addition and subtraction facts (BLM 21), addition webs (BLM 14) and subtraction webs (BLM 19).
- Create a double workspace using the Place value blocks tool. In the upper workspace, place 6 blocks and in the lower workspace, place 5 blocks. Highlight the 5 blocks and drag to the upper workspace to show $6 + 5 = 11$. Drag the 5 blocks back to the lower workspace and discuss the subtraction formed: $11 - 5 = 6$. Is there any

other way we could have moved the groups? Repeat the process, but this time move the 6 blocks to the lower workspace and back to show $5 + 6 = 11$ and $11 - 6 = 5$.

- Give students an opportunity to create 4 number sentences using a given number of blocks in a double workspace using the Place value blocks tool.

Extension work

- Link larger numbers using related number sentences, such as those on the Student Book page, using a calculator.

Language

linked, addition, add, plus, subtraction, take away, minus, remove, how many left, leaves, is equal to, equals, larger number, smaller number, diagram, number bond

Resources

- concrete materials (e.g. Multilink cubes, counters, books)
- calculators
- BLMs: 12 Number bonds (addition), 14 Addition webs, 17 Number lines, 19 Subtraction webs, 21 Addition and subtraction facts
- Maths tool: Place value blocks

Cross-reference

See also: p 31
Year 1 pp 115, 116

Evaluation

Is the student able to do the following?

- use commutative properties of addition and subtraction
- apply a range of mental strategies for addition and subtraction
- record number sentences

Answers

- 1 a $15 - 7 = 8$, $15 - 8 = 7$
 b $14 - 6 = 8$, $14 - 8 = 6$
 c $12 - 7 = 5$, $12 - 5 = 7$
 d $20 - 14 = 6$, $20 - 6 = 14$
 e $31 - 22 = 9$, $31 - 9 = 22$
 f $26 - 17 = 9$, $26 - 9 = 17$

Fun spot

Answers will vary. However, students will begin with an addition number sentence and write the 2 linked subtraction number sentences.

Strand: Measurement and space

Substrand: Geometric measure B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-GM-02

Content: Length: Compare and order lengths, using appropriate uniform informal units

- compare and order 2 or more shapes according to their lengths using an appropriate uniform informal unit
- compare the lengths of 2 or more objects that cannot be moved or aligned
- record length comparisons using drawings, numerals and words, and by referring to the uniform informal unit used

About this page

- *Concept box:* Discuss the picture and the fact that the pencil measures about 10 finger spaces. Demonstrate the term 'side by side'. Ask students to get a pencil and measure how many times their finger will fit along their pencil. Record the result. Compare the results and discuss why some students have different answers (e.g. length of the pencil, width of fingers).
- *Question 1:* Discuss the method of measuring 'side by side' without gaps or overlaps when we use pines blocks, and 'end to end' when we use paper clips. Other appropriate units can be used, but remember to change the unit in the answer.
- *Question 2:* Demonstrate how we use a hand span to measure length. Remind students that a hand span is the widest distance your hand can reach.
- Discuss the results of Question 2. Ask, 'Did everyone get the same answer? Why do you think this is so?' Discuss the advantages and disadvantages of informal units to measure lengths or distances.

Activity

- Note: Measuring lengths using informal units allows us to compare lengths or distances when the 2 lengths cannot be brought together for comparison. In this case, we are using steps as a means of measuring distances (i.e. the distance to the school canteen, the lunch seats and the library).
- Discuss the need for a formal unit of length. 'Why would we want one?', 'What use would it be?', 'What units of length do you know?', 'Who has heard of the metre?', 'Who has heard of the centimetre?', 'How big are these units?'

More teaching suggestions

- Give practical activities around the classroom and the playground in measuring distances using informal units, e.g. 'How many book lengths from your desk to the door?'
- Give experiences where students measure the length or width of items using any object as a unit. Emphasise that units must be placed end to end with no gaps or overlaps between each unit (e.g. 'How many book lengths from your desk to the door?').
- Discuss choices and suitability of different units (e.g. 'Which is more suitable to measure the length of a blackboard: a paintbrush or a paperclip?').
- Cut out footprints on cardboard (ensure they are all the same size). Use them as a unit to measure items in the room.

Extension work

- Discuss the disadvantages of informal units of measure.
- Use string to compare the circumferences of cylindrical objects.

Language

units, as long as, distance, equal lengths, length, shortest, longest, same, measure, guess, check

Resources

- various classroom objects (e.g. blocks, paperclips, craft sticks)
- (laminated) cardboard footprints
- string
- Example questions: Informal units of length

Cross-reference

See also: pp 37, 64, 68

Year 1 pp 32, 33, 40, 41

Evaluation

Is the student able to do the following?

- compare the lengths of 2 or more objects that cannot be moved or aligned
- record length comparisons using drawings, numerals and words, and by referring to the uniform informal unit used

Answers

- 1 Answers will vary.
- 2 Answers will vary.

Activity

Answers will vary.

9D Informal units of length

Strand: Measurement and space

Substrand: Geometric measure B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-GM-02

Content: Length: Compare and order lengths using appropriate uniform informal units

- compare and order 2 or more shapes according to their lengths using an appropriate uniform informal unit
- compare the lengths of 2 or more objects that cannot be moved or aligned
- record length comparisons using drawings, numerals and words, and by referring to the uniform informal unit used

About this page

- Note: Students should be encouraged to describe a length as the number and type of units used (e.g. the desk is 10 sticks long).
- *Concept box:* Discuss how many times the pen will fit across the desk. Talk about how the child has marked the length of the pen so he can count the total number of pens. This ensures a consistent unit of measurement. The mark should be made at the tip of the pen and the end of the pen placed next to the mark with no gaps or overlaps. A tally could also be kept as a count of the number of pen lengths used to measure the length of the desk.
- *Question 1:* Highlight the fact that the unit used is included in the answer.
- Ask students about the relationship between the size of a unit and the number of units needed (i.e. the shorter the unit, the more units are required). Conversely, the longer the unit, the fewer units are required (e.g. there will be more finger lengths than pencils needed to measure the desk).
- *Question 2:* Demonstrate how we use a hand span to measure length. Remind students that a hand span is the widest distance your hand can reach. Discuss the terms 'shorter' and 'longer'.
- Ask students to compare their results and discuss why there may be any discrepancies.
- *Question 3:* Encourage students to estimate (guess) then count the number of craft sticks required to measure the length. Ensure students understand that there should be no gaps or overlaps.

Activity

- Note: Using a piece of string to compare lengths is called 'indirect comparison'. We use indirect comparison when the 2 lengths cannot be brought together so that their lengths can be aligned. We usually use a length of

string, a piece of wood or the distance between the tips of our fingers as a means of carrying the 'length' of the first object to the second object to compare the lengths.

- Students need to make sure they measure from the end of the string. Emphasise that when using the string, students should try to be as accurate as possible.

More teaching suggestions

- Ask students to brainstorm a list of uniform informal units that could be used to measure the length of an object in the classroom (e.g. a bookshelf). Discuss the appropriateness of each unit. Suggest 3 objects to measure (e.g. a book, a desk and a cupboard). Make a list of the most appropriate uniform informal unit to measure each object. Discuss the list.
- Ask students to select 3 informal units. Make a list (like that in Question 1) with the headings 'Units used', 'Guess (estimation)' and 'Length'. Measure the bookcase using each of the units.
- Ensure students understand the importance of measuring with no gaps or overlaps. Encourage students to measure in straight lines, where possible, because if it is not a straight line, it will influence the result.
- Stress the importance of estimating before measuring. If our measure does not match our estimate, we should measure again in case we have made a mistake in our measuring. Compare the results. Are they different? Why?
- Ross the builder says: 'Measure twice, cut once.' What does this mean?

Extension work

- *How long is your shoe?:* Have each student trace their shoe onto thin cardboard and cut out the shape (or use prepared laminated 'shoes' of varying lengths). Ask the student to choose an informal unit to measure the length of the shoe and record the length.
- A different uniform informal unit can be chosen and the process repeated. Discuss the results.

Language

length, distance, end-to-end, gaps, overlaps, hand span, units of length, 10 shoes long etc., shorter than, longer than, measure

Resources

- various informal units of length (e.g. books, pencils, string)
- craft sticks
- cardboard and textas (or laminated cardboard shoes of varying lengths)
- Example questions: Informal units of length

Cross-reference

See also: pp 36, 64, 68
Year 1 pp 32, 33, 40, 41

Evaluation

Is the student able to do the following?

- compare the lengths of 2 or more objects that cannot be moved or aligned
- record length comparisons using drawings, numerals and words, and by referring to the uniform informal unit used

Answers

- ① Answers will vary.
- ② Answers will vary.
- ③ Answers will vary.

Activity

Answers will vary.

Sample Pages

10A How many more?

Strand: Number and algebra

Substrand: Combining and separating quantities B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CSQ-01

Content: Use knowledge of equality to solve related problems

- use number bonds to determine a missing number
- use a variety of ways of writing number sentences

About this page

- Encourage students to draw lines to link the same objects in the Concept box. This strategy will make it easier to add the 2 groups.
- By moving along a number line, students can tell how many more are needed (BLM 17).
- We can use adding on to solve these problems. Make a line of counters to show what has been added so far, and place a line of counters next to that one to show the total desired. We can then see how many extra counters we need to make the rows equal. When adding the known numbers, we can use different colours for each number. The extra counters in the longer row make it easy to see how many more need to be added to the smaller group. The shortfall can be counted to see how many more need to be added.
- *Question 1:* Remind students that there are 3 number needed to make 20.
- *Question 2:* Encourage students to work with a partner to describe how they found the missing number.

Investigation

- In the investigation, remind students that we will need to include zero in the number sentences.
- For the second part of the investigation, students can use drawings, concrete materials, diagrams or number sentences to show their answers.

More teaching suggestions

- Regularly revise counting on from a given number. 'What is five more than 6?' A number chart (BLM 2) will assist students with this exercise.
- Ask students to use number bonds (BLM 12) to consolidate finding a missing number.
- Encourage students to use a variety of strategies to find out how many more (e.g. drawing pictures, using a number chart (BLM 2), number lines (BLM 17), counting on, building to 10 and restructuring the number sentence as a subtraction).
- Review simple addition facts to 20. (See BLM 21 and BLM 15.) Encourage students to use the correct terminology for addition.

AQ: is BLM 15 (addition square and half square) here correct? Should it be BLM 40 as in the Resources?

- Note: At this stage, drill and practice of number facts should occur (BLM 40). Number bond houses (BLM 11) can be used to consolidate these number facts.

AQ: should these two points be left in as these tools are mentioned in the Resources?

Extension work

- Use the concept of money to find how much more (e.g. 'I need 50 cents. How much more money do I need if I have 30 cents?'). Allow students to use play money and a hundred chart if need be.

Language

how many more, count on, addition, add, plus, total, altogether, the same, makes, equals, is equal to, group, equal groups, fewer than, less than, number sentence, number story, missing number

Resources

- various concrete materials, including counters and plastic money
- BLMs: 2 Number chart, 17 Number lines, 21 Addition and subtraction facts, 40 Addition facts to 20
- Maths tools: Pan balance, Number lines

Cross-reference

See also: pp 30, 31
Year 1 pp 70, 71

Evaluation

is the student able to do the following?

- use number bonds to determine a missing number
- use a variety of ways of writing number sentences

Answers

- ① a 11 b $7 + 7 + 6 = 20$
c $5 + 9 + 6 = 20$ d $5 + 1 + 14 = 20$
- ② a 6 b 5 c 4 d 4
e 4 f 4 g 7 h 3
i 8 j 10

Investigation

- a $6 + 0 + 4 = 10$ $6 + 1 + 3 = 10$
 $6 + 2 + 2 = 10$ $6 + 3 + 1 = 10$
 $6 + 4 + 0 = 10$
- b $17 + 0 + 3 = 20$ $17 + 1 + 2 = 20$
 $17 + 2 + 1 = 20$ $17 + 3 + 0 = 20$

Answers will vary. Possible answers include:

- $10 + 0 + 10 = 20$ $10 + 1 + 9 = 20$
 $10 + 2 + 8 = 20$ $10 + 3 + 7 = 20$
 $10 + 4 + 6 = 20$ $10 + 5 + 5 = 20$
 $10 + 6 + 4 = 20$ $10 + 7 + 3 = 20$
 $10 + 8 + 2 = 20$ $10 + 9 + 1 = 20$
 $10 + 10 + 0 = 20$

10B Volume and capacity

Strand: Measurement and space

Substrand: Three-dimensional spatial structure B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-3DS-02

Content: Volume: Compare containers based on internal volume (capacity) by filling and packing

- make and use a device for measuring internal volume (capacity) calibrated in uniform informal units
- compare, order and record the internal volumes (capacities) of 2 or more containers by measuring each container in uniform informal units

About this page

- *Header:* Discuss the picture. Ask students, 'What do we call the water that does not fit into the container we are pouring it into?' (overflow). Discuss any situations where students have seen or experienced this (e.g. when a glass is full of liquid and ice is added to it, there is an overflow).
- The terms 'internal volume' and 'capacity' are interchangeable. They mean 'the space within a container' or 'what the container can hold'. Note: It is not necessary for students to know the names of formal units at this stage.
- Discuss the picture in Question 1, paying particular attention to the scale of the side of the container.
- Note the original water level (in A) and then the new level when the ball is added. When we subtract the original water level from the new water level, the difference is the volume of the ball (2 cups).
- In Question 1c and d, even though the shape of the plasticine has changed, the volume has not changed.
- In Question 2, encourage students to estimate if they are not sure and then compare their answers. Ask students to explain their reasoning.

Activity

- When attempting the activity, ask students to use a large see-through plastic or glass container. Ask students to record each step as it occurs.
- The teacher could demonstrate the experiment. The results could be discussed.

More teaching suggestions

- Provide students with opportunities to experiment with rising water levels by placing objects into a container (displacement) or show water overflowing by pouring the contents of a larger container into a smaller container. Ask students to predict what will happen. A water tray should be used outside to collect the overflow.
- Ask students to choose 2 objects and predict which object will give the greater displacement. Ask students

to test the prediction. Encourage students to find objects that are not too obvious in terms of size / weight.

- Note: Provide students with opportunities to manipulate and describe activities as this allows them to use the language of internal volume and capacity.

Extension work

- Students work in pairs. One student puts several cups of water into a container and their partner estimates the capacity of the container. Encourage partners to check their estimate by filling the container and counting the cups needed to fill the container.

Language

scale, volume and capacity, container, space occupied, object, measure, estimate, overflow, greatest capacity, experiment

Resources

- water
- containers (of various sizes, 1 large enough to hold a ball and water)
- ball (or similar object to submerge)
- plasticine
- water tray

Cross-reference

See also: p 44

Year 1 pp 44, 45, 49

Evaluation

Is the student able to do the following?

- compare, order and record the internal volumes (capacities) of 2 or more containers by measuring each container in uniform informal units

Answers

- a The ball has a volume of 2 cups.
 - b Two balls have a volume of 4 cups.
 - c The volume of the plasticine in C is 3 cups.
 - d The volume of the plasticine in D is 3 cups.
 - e Yes
- a Yes, it would overflow.
 - b No, glass B does not have the same capacity as glass A.
 - c Glass B has the same capacity as glass C.
 - d Glass A has the greatest capacity (not including D).

Activity

The experiment would be carried out and the results recorded.

100 Using graphs

Strand: Statistics and probability

Substrand: Data B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-DATA-02, MA1-DATA-01

Content: Identify a question of interest and gather relevant data

- pose suitable questions, where the answers form categories, and predict the likely responses
- collect data on familiar topics
- sort data into relevant categories

Content: Create displays of data and interpret them

- organise collected data into lists and tables to display information

About this page

- *Header:* 'What is the echidna is doing?' Ask, 'Why might this picture be in the header?'
- Discuss graphs and their purpose (i.e. graphs are used to compare objects and groups. A graph is a way of recording information so that it can be displayed or more easily interpreted).
- *Question 1:* Discuss the picture graph and revise the features (e.g. heading or title, pictures representing each group, symbols / shapes representing each response, symbols equally spaced across the graph, pictures in rows, a baseline or starting line to show where each row begins).
- Ask questions about the graph such as:
 - Why do you think this is called a picture graph?
 - What names could we give to each category?
 - Which is the smallest group?
 - Which is the largest group?
 - Can you tell how many boys and girls are included in the responses?
Ask students to explain their answer. Encourage students to answer in a sentence.
- Discuss the need for a graph to have pictures roughly the same size.
- *Question 2:* This is a data display that communicates information clearly. Ask, 'What features of a picture graph does it have?' (it uses pictures and it has categories), 'Are any of the usual features missing?' (there is no title and the pictures are not strictly in a row or in a column).

Fun spot

- A discussion about observing passing traffic and constructing a tally should occur.
- Discuss the Fun spot. Consider questions such as:
 - Which colours would we count?
 - Where would we stand?

- Would enough cars pass our position or would there be too many?
- How would we keep count: by writing numbers, using counters or drawing tally marks?
- What kind of graph would we draw: a picture graph or a column graph?
- A discussion about recording the colours in a packet of Smarties could occur.

More teaching suggestions

- As a class, make a graph like the one in Question 2, showing the birthday months of all the students in the class.
- Students could be asked to make their own graph as it provides a practical opportunity for them to compare objects and groups.
- Give each student a paper square on which to draw a favourite pet. Choose categories and display the results on the notice board. A category called 'other' may need to be made to represent pets that have been chosen only once.

Extension work

- Students can carry out one of the Fun spot surveys. Ask students to graph the results. Use cardboard to display the graph and an explanation of how the information was collected.

Language

graph, symbol, picture graph, table, data, tally, heading, rows, columns

Resources

- counters
- paper
- pencil
- clipboard / book to lean on
- cardboard

Cross-reference

See also: pp 9, 45, 65, 109, 113, 117, 136
Year 1 pp 25, 53, 61, 97, 124

Evaluation

Is the student able to do the following?

- collect data on familiar topics
- sort data into relevant categories
- organise collected data into lists and tables to display information

Sample Pages

Answers

- ① **a** 4 sandwiches
b 6 pies
c 2 apples
d 12 all together
e 4 more pies than apples
f

Sandwiches	4
Pies	6
Apples	2

g Answers will vary.

- ② **a** 3 girls **b** 1 girl **c** no girls
d 19 girls

Fun spot

A discussion about observing passing traffic, constructing a tally and recording the colour of Smarties will occur.

Sample Pages

10D Chance

Strand: Statistics and probability

Substrand: Chance B

Outcomes: Working mathematically (MA1-WM-01) pervades each strand. MA1-CHAN-01

Content: Identify and describe activities that involve chance

- describe possible outcomes in everyday activities and events as being *likely* or *unlikely* to happen
- compare familiar activities and events and describe them as being *more* or *less* likely to happen
- describe familiar events as being *possible*

About this page

- Revise the meaning of the term 'chance' as 'the possibility of something happening'.
- **Header:** Discuss the picture. Ask, 'What is the chance of burning your hand on the stove at home?'
- **Question 1:** Discuss the 2 pictures and ask students to explain why one picture is more likely to happen and the other is less likely to happen.
- **Question 2:** Have students suggest events that are more likely than less likely to happen to them (e.g. 'I will have a party on my next birthday'). Ask, 'Is this sure to happen?', 'Could you be too sick to have a party?'
- **Question 3:** Discuss the 'chance' vocabulary at the bottom of the Student Book page. Ask for volunteers to try the experiment.

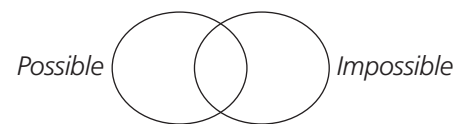
More teaching suggestions

- Have a class picture talk. Discuss the picture by asking questions in terms of 'chance' vocabulary. In a zoo scene, ask, 'Is it likely the tigers will escape from their enclosure?' Encourage students to justify their answers using the language of chance.
- Discuss chance words that are commonly used, in everyday conversations (e.g. 'might', 'certain', 'probably', 'likely', 'unlikely', 'possible', 'impossible').
- Use the language of chance to discuss activities in everyday contexts (e.g. 'It is unlikely that it will rain today', 'It is possible to stay up all night').
- Compare the likelihood of two events. 'Is it more likely that a student or a teacher will be next to come into our classroom?'
- Use spinners (BLM 32) to discuss outcomes that are more likely or less likely (e.g. spinning a number less than 3 or spinning a number greater than 3).
- Demonstrate the terms 'impossible', 'certain' and 'even chance' using a coin flip in the Probability tool. Students should create their own experiment with an even chance.
- Use the jumbler machine in the Probability tool to model an experiment. Use the words 'likely' and 'unlikely' to describe events.

- Students can use the Probability tool to create jumbler machines where the probability of selecting a red marble is impossible, unlikely, likely and certain. Students should complete the experiment and write an explanation of the descriptive term beside the machine with the text button.

Extension work

- Prepare 2 overlapping hoops and label 1 as 'possible' and 1 as 'impossible'.
- Ask students to write an event on a card and place it in the appropriate hoop.
- Ask students to discuss the placement of various events. Can any event be both possible and impossible at the same time? (No.)



Language

chance, might, certain, probably, likely, more likely, less likely, unlikely, possible, not possible, impossible

Resources

- 2 cards, 1 with 'possible' written on it and 1 with 'impossible' written on it
- blank cards
- hoops
- BLM: 32 Spinners
- Maths tool: Probability
- Maths tool activity: Probability

Cross-reference

See also: pp 61, 135
Year 1 pp 81, 128

Evaluation

Is the student able to do the following?

- describe possible outcomes in everyday activities and events as being *likely* or *unlikely* to happen
- compare familiar activities and events and describe them as being *more* or *less* likely to happen
- describe familiar events as being *possible*

Answers

- left side more likely, right side less likely
 - left side more likely, right side less likely
 - left side more likely, right side less likely
- Answers will vary.
- red likely, yellow impossible, blue unlikely, red or blue certain


Progress test 2

Name:

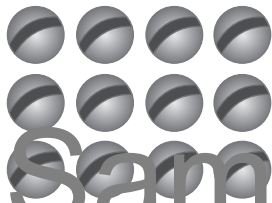
Number and algebra

1 Draw lines to show how you would share these collections equally.

a 10 counters 
 2 children

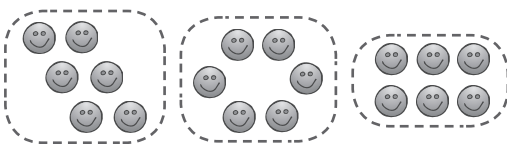
b 12 mushrooms 
 4 children

2 How many students could be given:



a 2 balls?

b 3 balls?

3 

How many groups?

How many in each group?

How many altogether?

groups of =

+ + =

4 

The birds show:

rows of =

6 + =

5 a $15 - 5 =$

b $16 - 4 =$

c $12 - 5 =$

d $16 - 8 =$

6 a $6 + 8 =$

b + 7 = 15

c $5 +$ = 13

d $14 - 8 =$

e $12 - 6 =$

f 7 less than 11 =

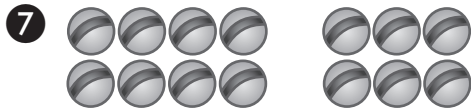
g $5 +$ = 10

h $12 +$ = 20

i What is the difference between 12 and 8?

Sample Pages

Progress test 2 (continued)



a $8 + 6 = \square$

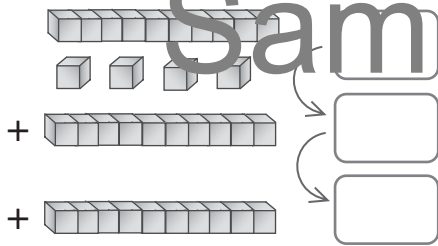
b $6 + 8 = \square$

c Write 2 different subtraction number sentences to match the picture above.

$\square - \square = \square$

$\square - \square = \square$

8 Write the totals, adding another ten for each row.



17, 27, 37, \square , \square , \square

98, 88, 78, \square , \square , \square

$54 + 20 = \square$

$39 + 40 = \square$

$75 - 10 = \square$

$76 - 30 = \square$

9 a $13 + 6 - 6 = \square$

b $23 - 5 + 5 = \square$

c Rajat had 15 balls. He lost 6 and bought 6 more. How many balls does he have now? \square

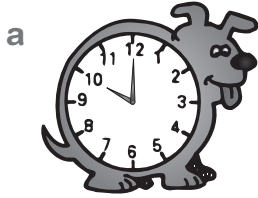
10 Write the value of each.



Progress test 2 (continued)

Measurement and space

11 Write the time.



o'clock



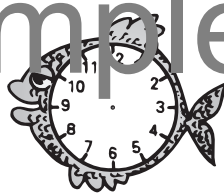
o'clock



Show the time.

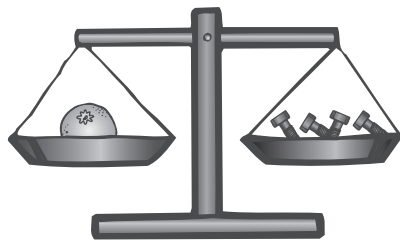


7 o'clock



half past 12

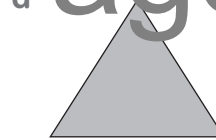
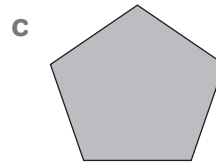
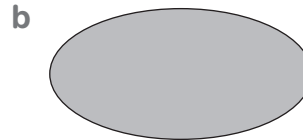
12



How many bolts would be needed to balance 2 oranges?

bolts

13 Name each shape.



14 Draw an octagon.

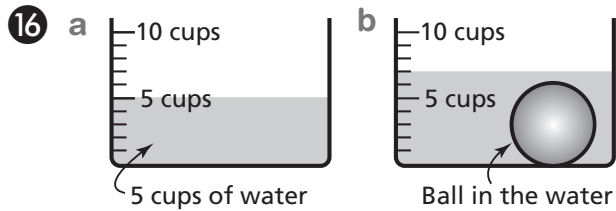


Progress test 2 (continued)

15 Use hand spans to measure this page.

Width of page:

Height of page:

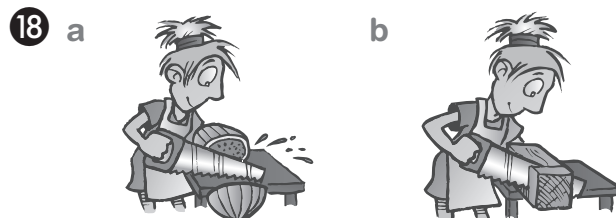


If the water from A was poured into B, would it overflow?

Vase	4 cups
Box	8 cups

- 17 a Which container has a smaller capacity?
- b How many more cups than the vase can the box hold? cups

Statistics and probability



Which is more likely?

19 The weather on our holidays

Sunny							
Rainy							
Cloudy							

Each square stands for 1 day.

- a How many days were sunny? days
- b How many days were cloudy? days
- c How long was our holiday? days
- d Complete this table for the graph.

Sunny	
Rainy	
Cloudy	

20 Use this list to complete the table and graph.

Favourite colour:

purple, yellow, purple, purple, yellow

Table: Favourite colour

purple	
yellow	

Graph:

purple				
yellow				

Notes and answers for Progress test 2

Objective

- Diagnose weaknesses for future treatment.

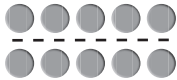

Follow-up



- Any weakness discovered should be treated. Copies of Student Book pages are cross-referenced for follow-up.
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| 2 | Division | p 23 |
| 3 | Multiplication and division | p 23 |
| 4 | Multiplication | pp 26, 27 |
| 5 | Subtraction | p 30 |
| 6 | Addition and subtraction | pp 31, 33 |
| 7 | Addition and subtraction | p 34 |
| 8 | Addition and subtraction | p 42 |
| 9 | Addition and subtraction | p 46 |
| 10 | Whole numbers | p 47 |
| 11 | Time | p 24 |
| 12 | Mass | p 32 |
| 13 | 2D shapes | p 28 |
| 14 | 2D shapes | p 29 |
| 15 | Length | pp 36, 37 |
| 16 | Capacity | p 39 |
| 17 | Capacity | p 44 |
| 18 | Chance | p 41 |
| 19 | Data | p 40 |
| 20 | Data | p 45 |

Progress test 2 answers

- 1 a  b 
- 2 a 6 b 4
- 3 3, 6, 18, 3 groups of 6 = 18, 6 + 6 + 6 = 18
- 4 2 rows of 6 = 12, 6 + 6 = 12

- 5 a 10 b 12 c 7 d 8
- 6 a 14 b 8 c 8 d 6 e 6
f 4 g 5 h 8 i 4
- 7 a 14 b 14 c 14 - 8 = 6 14 - 6 = 8
- 8 14, 24, 34 17, 27, 37, 47, 57, 67
98, 88, 78, 68, 58, 48 74, 79, 65, 46
- 9 a 13 b 23 c 15
- 10 a 10c b 50c c \$1 d \$2 e \$10
f \$100 g \$20
- 11 a 10 o'clock b 2 o'clock
c half past 3 or 3 thirty d half past 11 or 11 thirty
e  f 

- 12 8 (bolts)
- 13 a rectangle b oval c pentagon
d triangle
- 14  Answers will vary but the shape must have 8 straight sides.

- 15 about 1 or 2 hand spans about 2 hand spans
- 16 yes
- 17 a vase b 4 (cups)
- 18 B
- 19 a 3 (days) b 2 (days) c 11 (days)

d

Sunny	3
Rainy	6
Cloudy	2

- 20 Favourite colour:

purple, yellow, purple, purple, yellow

Table: Favourite colour

purple	3
yellow	2

Progress retest 2

Name:

Number and algebra

1 Draw lines to show how you would share these collections equally.

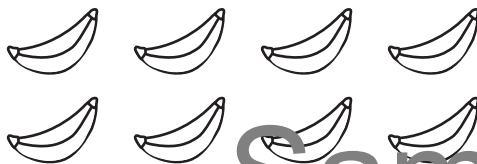
a 10 ice blocks
2 families



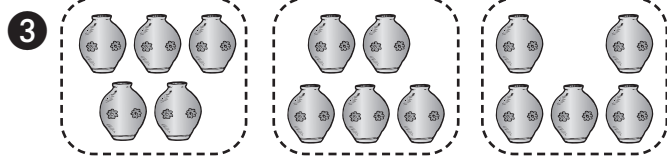
b 12 butterflies
4 groups



2 How many students could be given:



- a 2 bananas?
- b 4 bananas?



- How many groups?
- How many in each group?
- How many altogether?
- groups of =
- + + =



The tomatoes show:

rows of =

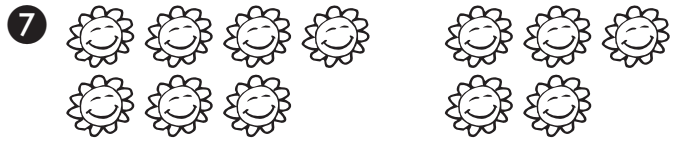
4 + =

- 5 a $7 - 2 =$
- b $15 - 7 =$
- c $11 - 3 =$
- d $17 - 8 =$

6 a $7 + 8 =$

- b + 5 = 14
- c $6 +$ = 11
- d $16 - 5 =$
- e $11 - 4 =$
- f 5 less than 13 =
- g $3 +$ + 2 = 12
- h $14 +$ + 5 = 25
- i What is the difference between 18 and 16?

Progress retest 2 (continued)



a $7 + 5 = \square$

b $5 + 7 = \square$

c Write 2 different subtraction number sentences to match the picture above.

$\square - \square = \square$

$\square - \square = \square$

8 Write the totals, adding another 10 for each row.

12, 22, 32, \square , \square , \square

85, 75, 65, \square , \square , \square

$32 + 20 = \square$

$22 + 40 = \square$

$85 - 20 = \square$

$75 - 40 = \square$

9 a $11 + 4 - 4 = \square$

b $21 - 6 + 6 = \square$

c Callum had 8 cards. He lost 5 and his Dad bought him 5 more. How many cards does he have now? \square

10 Write the value of each.

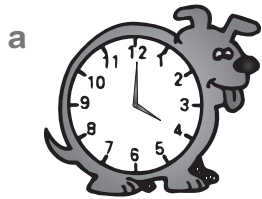


Sample Pages

Progress retest 2 (continued)

Measurement and space

11 Write the time.



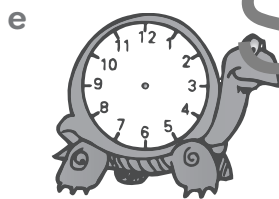
o'clock



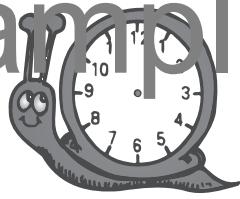
o'clock



Show the time.

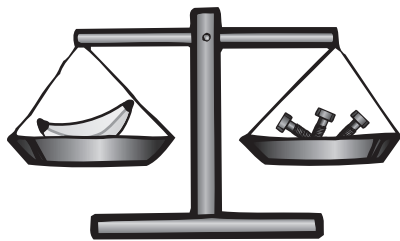


6 o'clock



half past 8

12



How many bolts would be needed to balance 2 bananas?

bolts

13 Name and describe each shape.



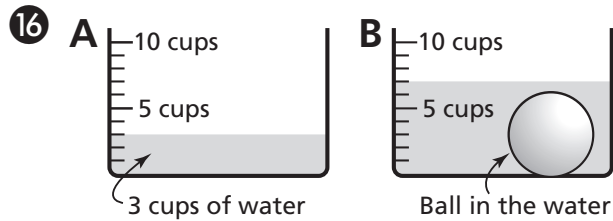
14 Draw an hexagon.



Progress retest 2 (continued)

- 15 Use hand spans to measure the length from your shoulder to your finger tips.

about hand spans



If the water from A was poured into B, would it overflow?

17

Bottle	2 cups
Lunch box	4 cups

- a Which container has a smaller capacity?
- b How many more cups than the bottle can the lunch box hold? cups

Statistics and probability



Which is more likely to be seen?

- 19 Fruit eaten

Bananas						
Apples						
Pears						

Each fruit stands for 1 piece of fruit eaten.

- a How many bananas were eaten?
- b How many apples were eaten?
- c How many more apples than pears were eaten?
- d Complete this table for the graph.

Bananas	
Apples	
Pears	

- 20 Use this list to complete the table and graph.

Favourite pet:

Table:

Dog	
Cat	

Graph:

Dog					
Cat					

Notes and answers for Progress retest 2

Objective

- Diagnose weaknesses for future treatment.

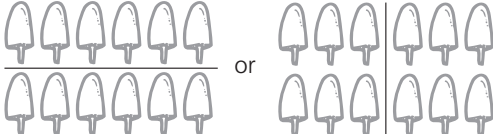
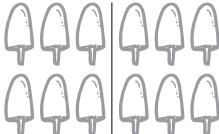
Follow-up

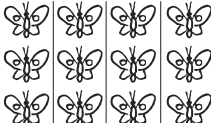
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| 16 | Capacity | p 39 |
| 17 | Capacity | p 44 |
| 18 | Chance | p 41 |
| 19 | Data | p 40 |
| 20 | Data | p 45 |

Progress retest 2 answers


1 a  or 



- 2 a 4 b 2
- 3 3, 5, 15, 3 groups of 5 = 15, 5 + 5 + 5 = 15
- 4 2 rows of 4 = 8, 4 + 4 = 8
- 5 a 5 b 8 c 8 d 9
- 6 a 15 b 9 c 5 d 11 e 7
f 8 g 7 h 6 i 2
- 7 a 12 b 12 c $12 - 7 = 5$ $12 - 5 = 7$
- 8 8, 18, 28 12, 22, 32, 42, 52, 62
85, 75, 65, 55, 45, 35 52, 62, 65, 35
- 9 a 11 b 21 c 8
- 10 a \$2 b 20c c 5c d 10c e \$5
f \$20 g \$50
- 11 a 4 o'clock b 8 o'clock
c half past 2 or 2 thirty
d half past 1 or 1 thirty



- 12 (10, 5)
- 13 a triangle b octagon c hexagon
d pentagon

14  Answers will vary but the shape must have 6 straight sides.

- 15 about 4 (hand spans)
- 16 no
- 17 a bottle b 2 (cups)
- 18 A
- 19 a 5 (bananas) b 6 (apples) c 3 (more apples)

d

Bananas	5
Apples	6
Pears	3

20 Table:

Dog	5
Cat	3

Graph:

Dog					
Cat					

Progress retest 2

Name:

Number and algebra

1 Draw lines to show how you would share these collections equally.

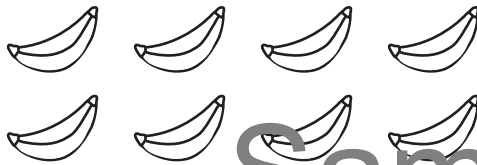
a 10 ice blocks
2 families



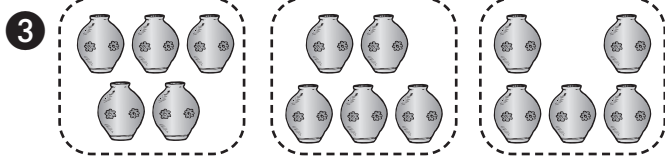
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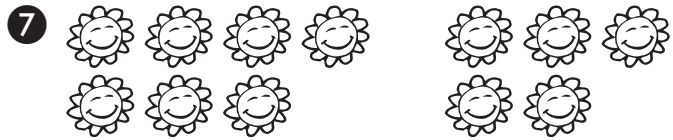
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- i What is the difference between 18 and 16?

Progress retest 2 (continued)



a $7 + 5 = \square$

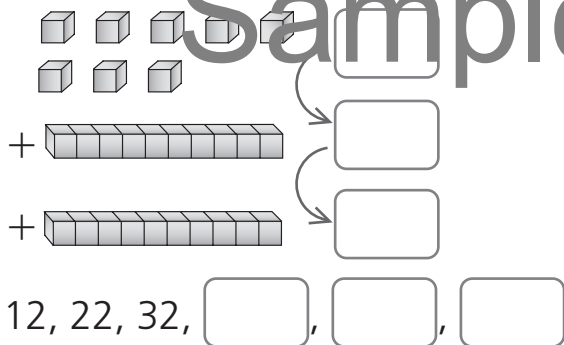
b $5 + 7 = \square$

c Write 2 different subtraction number sentences to match the picture above.

$\square - \square = \square$

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8 Write the totals, adding another 10 for each row.



12, 22, 32, \square , \square , \square

85, 75, 65, \square , \square , \square

$32 + 20 = \square$

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b $21 - 6 + 6 = \square$

c Callum had 8 cards. He lost 5 and his Dad bought him 5 more. How many cards does he have now? \square

10 Write the value of each.

a  \square

b  \square

c  \square

d  \square

e  \square

f  \square

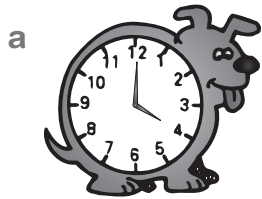
g  \square

Sample Pages

Progress retest 2 (continued)

Measurement and space

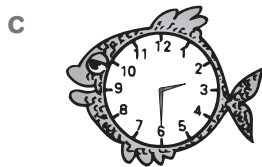
11 Write the time.



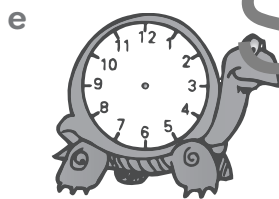
o'clock



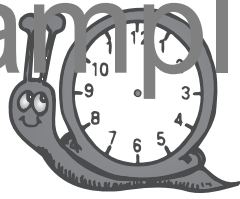
o'clock



Show the time.

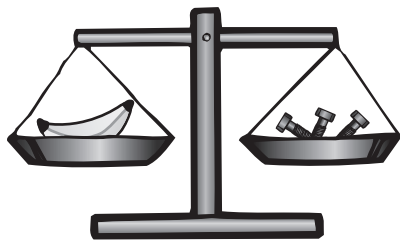


6 o'clock



half past 8

12



How many bolts would be needed to balance 2 bananas?

bolts

13 Name and describe each shape.



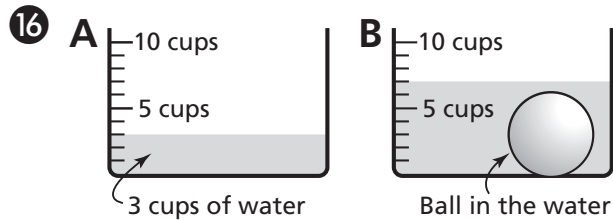
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- 15 Use hand spans to measure the length from your shoulder to your finger tips.

about hand spans



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Lunch box	4 cups

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Apples						
Pears						

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- c How many more apples than pears were eaten?
- d Complete this table for the graph.

Bananas	
Apples	
Pears	

- 20 Use this list to complete the table and graph.

Favourite pet:

dog, dog, cat, dog, cat, dog, cat, dog

Table: Favourite pet

Dog	
Cat	

Graph:

Dog					
Cat					

Notes and answers for Progress retest 2

Objective

- Diagnose weaknesses for future treatment.

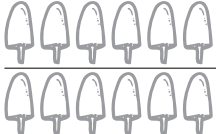
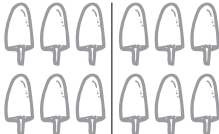

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Progress retest 2 answers


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 4 2 rows of 4 = 8, 4 + 4 = 8
 5 a 5 b 8 c 8 d 9
 6 a 15 b 9 c 5 d 11 e 7
 f 8 g 7 h 6 i 2
 7 a 12 b 12 c $12 - 7 = 5$ $12 - 5 = 7$
 8 8, 18, 28 12, 22, 32, 42, 52, 62
 85, 75, 65, 55, 45, 35 52, 62, 65, 35
 9 a 11 b 21 c 8
 10 a \$2 b 20c c 5c d 10c e \$5
 f \$20 g \$50

- 11 a 4 o'clock b 8 o'clock
 c half past 2 or 2 thirty
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- 12 (10, 5)
 13 a triangle b octagon c hexagon
 pentagon

14  Answers will vary but the shape must have 6 straight sides.

- 15 about 4 (hand spans)
 16 no
 17 a bottle b 2 (cups)
 18 A
 19 a 5 (bananas) b 6 (apples) c 3 (more apples)

d

Bananas	5
Apples	6
Pears	3

20 Table:

Dog	5
Cat	3

Graph:

Dog					
Cat					

AUSTRALIAN  **Signpost** MATHS
NSW

Sample Pages



Mentals

Alan McSeveny

Diane McSeveny-Foster

Rachel McSeveny

30 days has September, April, June and November. All the rest have 31 except February alone, which has 28 days clear and 29 days each leap year.

1

12	18	14
- 9	- 3	- 5
_____	_____	_____

2

7 + 5 + 5 = _____

4 + 4 + 3 = _____

6 + 6 + 2 = _____

1 + 3 + 3 = _____

3 + 7 + 7 = _____

3 Circle the 8th crocodile.



4 19 cakes.

5 eaten.

-

How many now?

5 Complete these number sentences.

8	+	_____	=	15
6	+	_____	=	
11	+	_____	=	



6 Circle the sphere.
Cross the pointed object.



7 How many days in:

a March? _____

b September? _____

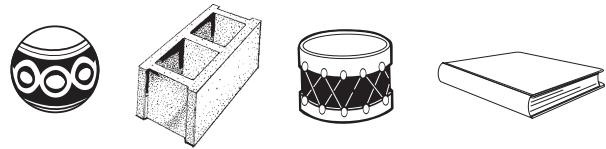
c July? _____



8 Look for tens to find:

2	7	9
1	4	1
8	2	5
+ 4	+ 3	+ 5
□	□	□

9 Circle the objects that will roll down a hill.

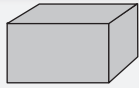


10 Does 3 + 6 = 6 + 3? _____

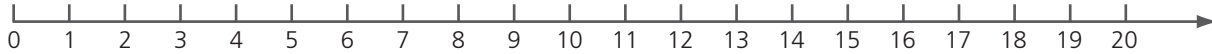
Does 5 + 7 = 7 + 5? _____

11 65 = _____ tens _____ ones

6:2




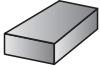

1



14 - 7 = _____ 15 - 5 = _____ 12 - 3 = _____ 19 - 6 = _____

2 Complete the table using ticks or crosses.



Object	Curved surface(s)	Flat surface(s)	Slides	Rolls	Stacks
					
					
					

3 Write the number 1 more than: 45 _____ 63 _____ 38 _____

Write the number 1 less than: 36 _____ 57 _____ 72 _____

Sample Pages

4 $6 + 3$ $4 + 3$ $5 + 2$ $7 + 3$ $3 + 3$

6:3

 +  = + =



1 Complete these addition facts.

	+ 1	+ 2	+ 3	+ 4	+ 5	+ 6	+ 7	+ 8	+ 9
4									

	+ 5	+ 9	+ 2	+ 7	+ 8	+ 1	+ 3	+ 6	+ 4
7									



1 Say each clock time above.

2 $5 + 3 + 3 = \underline{\quad}$

$8 + 2 + 2 = \underline{\quad}$

$4 + 4 + 5 = \underline{\quad}$

3 Complete these number sentences.

$\frac{7}{\quad}$	+	$\underline{\quad}$	=	17
$\frac{9}{\quad}$	+	$\underline{\quad}$	=	
$\frac{8}{\quad}$	+	$\underline{\quad}$	=	



4 Look for tens to find.

6	9	2
3	7	4
4	1	8
+ 1	+ 3	+ 3
<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;"></div>

5 Draw a line to share 8 stickers between 2 children.



One share = $\underline{\quad}$

6 Circle the objects that can roll.



7 Circle 3 rows of 4.

○	○	○	○
○	○	○	○
○	○	○	○

$\underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

$\underline{\quad}$ rows of $\underline{\quad} = \underline{\quad}$

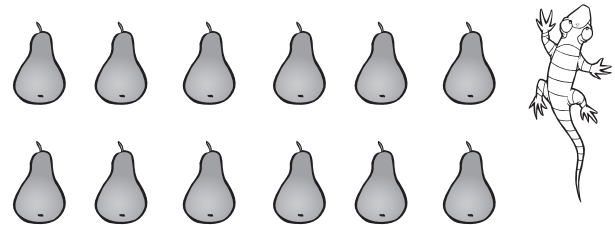
8 Circle the one that takes less time.



Wash hands

Do the dishes

9 Circle groups to show how many students could have 2 pears.



$\underline{\quad}$ students could have 2 pears.

10 $85 = \underline{\quad}$ tens $\underline{\quad}$ ones

11 $8 + 1$ $3 + 3$ $3 + 6$ $4 + 3$ $4 + 4$

Sample Pages

7:2

1:00

o'clock

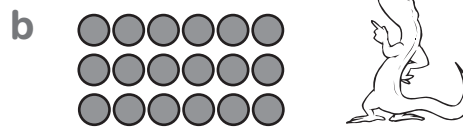
4:00

o'clock



___ rows of ___ = ___

___ + ___ = ___



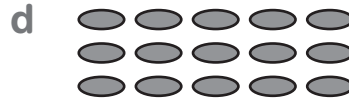
___ rows of ___ = ___

___ + ___ + ___ = ___



___ rows of ___ = ___

___ + ___ = ___



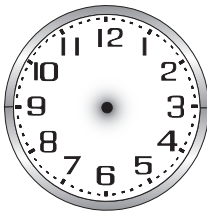
___ rows of ___ = ___

___ + ___ + ___ = ___

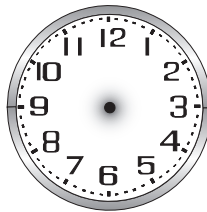
2 Show the times on these digital and analog clocks:



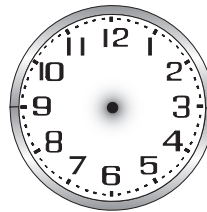
6 o'clock



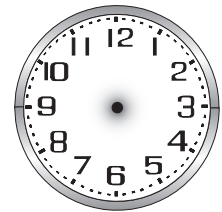
half past 3



4 thirty



half past 9

**7:3**

 +  = balls

1 Complete these number sentences for each total.

a $\frac{10}{8}$ + ___ =

$\frac{12}{9}$ + ___ =

16

b $\frac{11}{7}$ + ___ =

$\frac{10}{8}$ + ___ =

13

c $\frac{16}{9}$ + ___ =

$\frac{15}{10}$ + ___ =

20

8:1

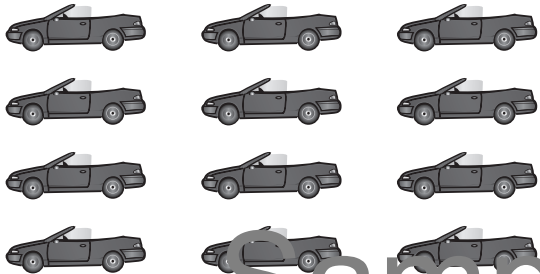


- 1 Draw a line to share 10 stars between 2 children.



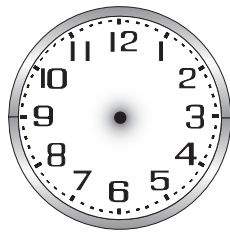
One share = _____


- 2 12 cars. Circle groups to show how many children could take 4 cars.



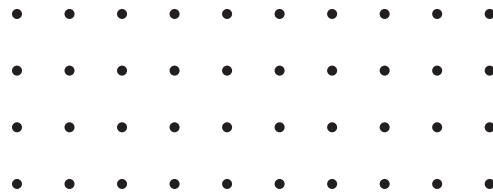
_____ children could take 4 cars.

- 3 Show half past 9 on this analog clock.



- 4
- 
- _____ groups of _____ = _____
- 4 + _____ + _____ = _____

- 5 Use a ruler to draw triangles. Start and finish each line at a dot.

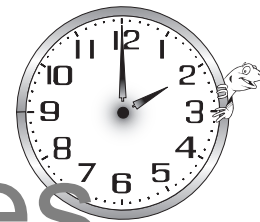


- 6 2 rows of 6 = _____

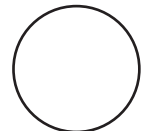


_____ + _____ = _____

- 7 The time is _____ o'clock.



- 8 Match the shapes and names.



triangle

circle

square

Colour half of each shape.

- 9 5 - 2 _____ 10 - 1 _____

8 - 3 _____ 9 - 4 _____

5 - 3 _____ 8 - 2 _____

- 10 6 + 2 3 + 4 5 + 2 5 + 4 2 + 1

8:2



1 Draw a line to join each shape to its name.

hexagon

circle

square

triangle

rectangle

star

quadrilateral

pentagon

oval

2 Write the time in words and numerals.

a b

Sample Pages

:

:

:

Half past nine

:

Half

8:3

, groups of =

1

_____ groups of _____ = _____

5 + 5 + _____ = _____

2

_____ groups of _____ = _____

3 + 3 + _____ + _____ = _____