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NZ for NZ

Help Me at HOME Series



Curriculum Strand Worksheets

A Teacher's resource supplied as PHOTOCOPY MASTERS

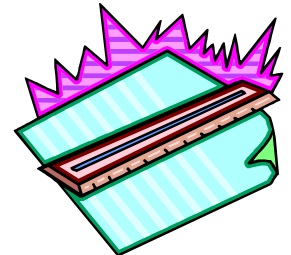
Book 7b



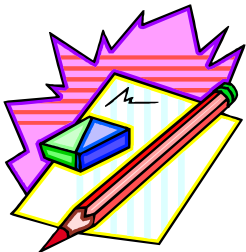
This resource contains
**40 CURRICULUM STRAND
WORKSHEETS**



which covers **Level 4** of the achievement
objectives as outlined in the
**Mathematics in the New Zealand
Curriculum for the strands ...**
Number & Algebra,
Measurement & Geometry
and Statistics.



This resource is to be used in conjunction
with **Book 7a** and supports the
**Numeracy Professional Development
Project Stages 6 to 8**



Author: A. W. Stark



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Class: _____

Author: A. W. Stark



AH7b

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Note from the author:

About this resource ...

Help Me at Home Curriculum Strand Worksheets

- Book 7b (Code: AH7b)

is one of a series of **TWO sets** of 8 resources and has been written to cover the achievement objectives as outlined in the *Mathematics in the New Zealand Curriculum* (2007 revised edition) document for the teaching areas or strands of ... Number & Algebra, Measurement & Geometry and Statistics.

Resource Book 7b is to be used in conjunction with a second resource, Book 7a.

Help Me at Home Number Knowledge Worksheets

- Book 7a (Code: AH7a)

Book 7a has been written to support the *Numeracy Professional Development Project* currently being implemented within many New Zealand schools.

Background Information:

The *Numeracy Professional Development Project* being implemented in many schools involves a **knowledge section** and a **strategy section**.

The **knowledge section** introduces and revises the key number knowledge facts required.

The **strategy section** describes the mental processes students employ to estimate answers and solve problems involving the four operations of addition, subtraction, multiplication and division.

The **strategy stages** are listed in this table.

The aim of this project is to equip students with various strategies that allow them to be successful at Mathematics.

In order for this to occur, it is essential for students to be confident with number knowledge.

	Strategy Stages
0	Emergent
1	One-to-one Counting
2	Counting from One on Materials
3	Counting from One by Imaging
4	Advanced Counting (Counting On)
5	Early Additive Part-Whole
6	Advanced Additive Part-Whole
7	Advanced Multiplicative Part-Whole
8	Advanced Proportional Part-Whole

Without the 'knowledge', that is, knowing the basic numeracy facts, it is difficult for a student to progress through the strategy stages. Students move through the strategy stages at different rates and may be working at different stages given a certain problem. This is often a result of gaps in key knowledge, hence it CANNOT be stressed enough the importance of learning the numeracy facts. How children learn the numeracy facts is not as important as knowing them. These resources are designed to systematically introduce and revise the key numeracy facts.

How to use these resources:

There are **2 sets** of **8 resources** in this series.

The table opposite shows the suggested Year Group each book can be used at, but this is only a suggestion.

Example: 1 - 2 - 3 means it is likely to be used at Year 2, the bold underlined number.

Book	Resource Code	<u>Suggested Year Group</u> (underlined)	Strategy Stages covered	Curriculum Level
1a / 1b	AH1a & AH1b	1 - <u>2</u> - 3	1 to 3	1
2a / 2b	AH2a & AH2b	2 - <u>3</u> - 4	4	1 / 2
3a / 3b	AH3a & AH3b	3 - <u>4</u> - 5	4 & 5	2
4a / 4b	AH4a & AH4b	4 - <u>5</u> - 6	5 & 6	2 / 3
5a / 5b	AH5a & AH5b	5 - <u>6</u> - 7	6 & 7	3
6a / 6b	AH6a & AH6b	6 - <u>7</u> - 8	6 & 7	3 / 4
7a / 7b	AH7a & AH7b	7 - <u>8</u> - 9	6 to 8	4
8a / 8b	AH8a & AH8b	8 - <u>9</u> - 10	6 to 8	5

Why so many resources?

A note for Teachers

There are 2 sets of 8 resources in this series to allow you to have a different book available each year for classes which are made up of mixed year groups. This will stop the problem of a student saying "We used this book last year!". Which book you use for your class is up to your professional judgement, taking into account which resource classes above or below your class might use.

How to use these TWO resources - Book 7a & Book 7b



Book AH7a

40x Number Knowledge Worksheets

- This resource systematically introduces and revises the number knowledge, presented in various formats.
- Designed to reinforce the Numeracy Professional Development Project, it is intended that one worksheet per week is completed in order from worksheet 1 to worksheet 40.
- One worksheet per week is to be done in conjunction with one worksheet selected from the **Curriculum Strand Worksheet** resource (**Book 7b**).
- **Book 7a** covers the **Strategy Stages** 6 to 8.

Note to Teachers:

- The aim of these TWO resources (**AH7a & AH7b**) are to provide the classroom teacher with a systematic and comprehensive series of worksheets, which form the basis of your mathematics homework.

Worksheets from Book 7a:

- **Photocopy** weekly and sequentially in order, a **Number Knowledge** worksheet from **Book 7a**. On the Number Knowledge worksheet, pupils can record their **Name, Term, Week** and the **Curriculum Strand Worksheet** that is also to be done that week.

Worksheets from Book 7b:

- **Select** and **photocopy** the appropriate **Curriculum Strand Worksheet** required, as determined by what you are currently teaching in class or a topic you are revising. In the table on the next page, record the curriculum worksheet being used each week.

Select ONE worksheet from each book to make up your homework worksheet

Book AH7b

40x Curriculum Strand Worksheets

- The **40 worksheets** in this resource cover the Achievement Objectives as outlined in **Mathematics in the New Zealand Curriculum** for Number & Algebra, Measurement & Geometry and Statistics.
- These worksheets can be completed in any order.
- One worksheet is selected per week to be done in conjunction with one worksheet from the **Number Knowledge Worksheet** resource (**Book 7a**).
- The worksheet selected per week relates to the topic being covered at school or as revision.
- **Book 7b** covers Level 4 of the **Curriculum**.

Extension Activity for Parents:

- Each **Curriculum Strand Worksheet** has an **AT HOME** activity as an extension activity for parents or caregivers.
- Success in mathematics is greatly enhanced by having a good understanding of Number Knowledge. That is, from being able to add, subtract, multiply and divide with confidence, ... with success ... comes enjoyment.
- Either staple the two worksheets together or create a double sided homework sheet.

Book 7a (AH7a) - Number Knowledge Worksheets

Number Knowledge Worksheet	Term & Week Enter details below	Curriculum Strand Worksheet Enter the worksheet number issued each week	Number Knowledge Worksheet	Term & Week Enter details below	Curriculum Strand Worksheet Enter the worksheet number issued each week
1	Term: Week:		21	Term: Week:	
2	Term: Week:		22	Term: Week:	
3	Term: Week:		23	Term: Week:	
4	Term: Week:		24	Term: Week:	
5	Term: Week:		25	Term: Week:	
6	Term: Week:		26	Term: Week:	
7	Term: Week:		27	Term: Week:	
8	Term: Week:		28	Term: Week:	
9	Term: Week:		29	Term: Week:	
10	Term: Week:		30	Term: Week:	
11	Term: Week:		31	Term: Week:	
12	Term: Week:		32	Term: Week:	
13	Term: Week:		33	Term: Week:	
14	Term: Week:		34	Term: Week:	
15	Term: Week:		35	Term: Week:	
16	Term: Week:		36	Term: Week:	
17	Term: Week:		37	Term: Week:	
18	Term: Week:		38	Term: Week:	
19	Term: Week:		39	Term: Week:	
20	Term: Week:		40	Term: Week:	

Book 7b (AH7b) - Curriculum Strand Worksheets

(Tick next to worksheet as each ONE worksheet is issued per week)

1	Revision	<i>Tick</i>	21	Geometry words & naming angles	<i>Tick</i>
2	Addition & subtraction strategies		22	Reading scales, drawing lines & angles	
3	More addition & subtraction strategies		23	Angle rules	
4	Addition & subtraction of decimals		24	Perimeter	
5	Multiplication strategies		25	Area - Squares and rectangles	
6	Division strategies		26	Area - Triangles & Parallelograms	
7	Multiplication & division of decimals		27	Volume	
8	Special numbers		28	Time, tables & scale diagrams	
9	Order of Operations		29	2-D and 3-D shapes / Nets	
10	Equivalent fractions / simplifying		30	Grid references & co-ordinates	
11	More fractions		31	Compass points compass bearings	
12	Fractions / decimals / percentages		32	Rotation & reflection	
13	Multiplying & dividing by powers of 10		33	Translation & enlargements	
14	Negative numbers		34	Column graphs, pictograms & dot plots	
15	Solving equations		35	Stem and leaf graphs & time series graphs	
16	Using formulae		36	Frequency tables, histograms & % bar graphs	
17	Number patterns or sequences		37	Pie Graphs	
18	Measuring units - length		38	Finding 'averages' and the range	
19	Measuring units weight (mass)		39	Interpreting data / Creating a report	
20	Measuring units volume (capacity)		40	Outcomes / Probability	

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Curriculum Strand Worksheets

(Level 4)

Number & Algebra,

Measurement & Geometry,

and Statistics

Worksheets

Select **ONE** Curriculum Strand Worksheet per week from this book (AH7b) to be completed in conjunction with **ONE** Number Knowledge Worksheet, selected from Book 7a (AH7a).

Record your selection in the table at the front of this resource.

Reading numerals and writing number words.

Write these numerals as number words.

- (1) 9.4 _____
- (2) 605 _____
- (3) 89.6 _____
- (4) 918.7 _____
- (5) 4713 _____

The place a digit has in a number will affect its value.

Example: In 41.62, the 6 has a place value of $\frac{1}{10}$ and means 0.6.



What is the **place value** of the **BOLD** digit in each number and what does it mean?

- | | Place value | means |
|----------------------|-------------|-------|
| (6) 12 4 .83 | _____ | 4 |
| (7) 4 7 6.56 | 10's | _____ |
| (8) 183.9 5 2 | _____ | _____ |
| (9) 26. 3 08 | _____ | _____ |
| (10) 7.0 4 3 | _____ | _____ |

When **rounding** a number to the **nearest 100**, look at the 10's **place value** number.

Example: **767** rounds **up** to 800 (5, 6, 7, 8, 9 \uparrow)
but **437** rounds **down** to 400 (0, 1, 2, 3, 4 \downarrow)

When **rounding** a number to the **nearest 1000**, look at the 100's **place value** number.

Example: **7675** rounds **up** to 8000 (5, 6, 7, 8, 9 \uparrow)
but **4372** rounds **down** to 4000 (0, 1, 2, 3, 4 \downarrow)

Round these numbers to the nearest ...

- | | 10 | 100 | 1000 |
|-----------|-------|-------|-------|
| (11) 1425 | _____ | _____ | _____ |
| (12) 5639 | _____ | _____ | _____ |
| (13) 3974 | _____ | _____ | _____ |

- (14) 13908 _____
- (15) 41850 _____

When **rounding** a decimal to **1 decimal place (1 d.p.)**, look at the $\frac{1}{100}$'s **place value digit**.



Example: 4.5**6** rounds **up** to 4.6 (5, 6, 7, 8, 9 \uparrow)
but 2.4**3** rounds **down** to 2.4 (1, 2, 3, 4 \downarrow)

Round these decimals to **1 decimal place**.

- (16) 6.49 _____
- (17) 32.83 _____
- (18) 19.75 _____
- (19) 342.68 _____
- (20) 70.349 _____

(21) Write these decimals in order from smallest to largest.

- 154
- 0.153
- 1.59
- 15.7
- 1530
- 0.0151

Using the five digits in this box and a decimal point, create the largest number closest to 40.

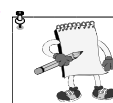
9 4 7 0 1 • Answer: 40.179

(22) Use these digits ...

8 9 1 7 6 5 •

to make the three closest numbers below and above 16, in order from smallest to largest.

_____, _____, _____
16.0000,
_____, _____, _____



The aim of this activity sheet is to revise reading, writing & ordering numbers or decimals and place value & rounding.

Suggested extension activity:

Make up similar questions as on this worksheet to see if your child understands the various mathematical activities revised.

Example: Write 5.0392 in words. What is the place of the 5 in 19.54? Round 345.93 to the nearest tenth. Order these numbers from smallest to largest, 15.2, 1.53, 0.159, 157, 1540.

Sign when completed: _____

There is more than one way to work out an answer. Here are some examples.

Groupings of 10, 100 or 1000

Adding 65 + 7 + 40 is the same as 100 + 12 = 112

- (1) 169 + 8 + 40 = 209 + _____ = _____
- (2) 340 + 29 + 780 = _____ + _____ = _____
- (3) 1810 + 1190 + 36 = _____ = _____

Round to make '10' or a 'multiple of 10'

Add 95 + 9 (add 5 to 95, subtract 5 from 9)

Answer: 95 + 9 = 100 + 4 = 104

- (4) 187 + 49 = 190 + _____ = _____
- (5) 83 + 879 = _____ + _____ = _____
- (6) 394 + 168 = _____ + _____ = _____

Adding or subtracting 100's, 10's and 1's

Add 616 + 453

(100's) 600 + 400 (10's) 10 + 50 (1's) 6 + 3

Answer: 1000 + 60 + 9 = 1069

- (7) 613 + 386 is the same as ...
600 + _____ + 10 + _____ + 3 + _____ = _____
- (8) 695 + 233 is the same as ...
_____ = _____
- (9) 839 - 327 is the same as ...
_____ = _____

Splitting numbers to make '10'

Work out 375 - 8 = ● (375 = 370 + 5)

370 - 8 = 362, Answer: 362 + 5 = 367

- (10) 403 - 9 is the same as ...
400 - 9 + _____ = _____
- (11) 874 - 7 is the same as ...
_____ - 7 + _____ = _____
- (12) 971 - 9 is the same as ...
_____ = _____

Equal additions to make 'tidy' numbers

Subtract 162 - 96 (add 4 to both numbers)

Answer: 162 - 96 = 166 - 100 = 66

- (13) 96 - 58 = 98 - _____ = _____
- (14) 241 - 197 = _____ - _____ = _____
- (15) 873 - 248 = _____ - _____ = _____

Don't subtract ... add

103 - 75 = ● is the same as 75 + ● = 103

Use 'tidy' numbers to work this out.

71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110

Annotations: A double-headed arrow above the table spans from 75 to 80 with '+5' written above it. A double-headed arrow below the table spans from 95 to 100 with '+5' written below it. A double-headed arrow below the table spans from 100 to 103 with '+3' written below it.

Answer: 5 + 20 + 3 = 28 (75 + 5 + 20 + 3 = 103)

- (16) 93 - 56 = ● is the same as 56 + ● = 93
● = 4 + 30 + _____ = _____
- (17) 457 - 89 = ● is the same as 89 + ● = 457
● = _____ + _____ + _____ = _____
- (18) 723 - 167 = ● is the same as 167 + ● = 723
● = _____ + _____ + _____ = _____

Work out the problems using any strategy you like.



- (19) 199 - 83 = _____ = _____
- (20) 482 + 89 = _____ = _____
- (21) 393 - 75 = _____ = _____
- (22) 834 - 586 = _____ = _____
- (23) 98 + 126 = _____ = _____
- (24) 45 + 61 + 19 = _____ = _____
- (25) 486 - 254 = _____ = _____
- (26) 85 + 187 = _____ = _____
- (27) 54 + 98 + 52 = _____ = _____



The aim of this activity sheet is to look at different strategies that could be used to work out addition or subtraction problems.

Suggested extension activity:

Make up similar questions that cover the basic numeracy facts at the back of this resource. These are **key number knowledge facts**.

The strategies used on this worksheet are only a suggestion. Your child may not need to use some or all of these strategies and may have strategies of their own. Encourage them to talk about how they work out their answers. Remember that working out the answer with confidence is more important than the strategy used.

Sign when completed: _____

Don't subtract ... add

$92 - \bullet = 58$ is the same as $58 + \bullet = 92$

Use 'tidy' numbers to work this out.

51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

← -6 →

+40

Add a 'large' tidy number, then count back

Answer: $40 - 6 = 34$ ($58 + 40 = 98 - 6 = 92$)

- (1) $145 - 89 = \bullet$ is the same as $89 + \bullet = 145$
 $\bullet = 60 - \underline{\quad} = \underline{\quad}$
- (2) $315 - 117 = \bullet$ is the same as $117 + \bullet = 315$
 $\bullet = \underline{\quad} - \underline{\quad} = \underline{\quad}$
- (3) $765 - 389 = \bullet$ is the same as $389 + \bullet = 765$
 $\bullet = \underline{\quad} - \underline{\quad} = \underline{\quad}$

- (9) Last month, Peter bought items worth the following ... _____

\$507, \$83, \$1462,
\$169 and \$9.



Work out how much he spent using column addition. + _____

Subtracting using columns & renaming

Subtract $653 - 389 = ?$

$\begin{array}{r} 4 \quad 13 \\ 653 \\ - 389 \\ \hline 4 \end{array}$	$\begin{array}{r} 5 \quad 14 \quad 13 \\ 653 \\ - 389 \\ \hline 64 \end{array}$	$\begin{array}{r} 5 \quad 14 \quad 13 \\ 653 \\ - 389 \\ \hline 264 \end{array}$
---	---	--

... 53 is renamed as 4 & 13 ... ($13 - 9 = 4$).
 ... 64 is renamed as 5 & 14 ... ($14 - 8 = 6$).
 ... finally ... $5 - 3 = 2$



Rewrite these numbers in columns, then subtract.

- (10) $869 - 495$ (12) $1270 - 869$
- _____
-
- _____

- (11) $4523 - 1679$ (13) $6000 - 2495$
- _____
-
- _____

- (14) Abbey has \$1514 in her bank account. If she spends \$876, use column subtraction to work out how much she has left. _____



The aim of this activity sheet is to look at different strategies that could be used to work out addition or subtraction problems.

Suggested extension activity:

Make up similar questions that cover the basic numeracy facts at the back of this resource. These are **key number knowledge facts**.

The strategies used on this worksheet are only a suggestion. Your child may not need to use some or all of these strategies and may have strategies of their own. Encourage them to talk about how they work out their answers. Remember that working out the answer with confidence is more important than the strategy used.

Sign when completed: _____

Both sides are equal

Find the missing number ... $57 + 32 = \bullet + 30$
 (add 2 to 57 because 30 is 2 less than 32)

Answer: $57 + 32 = 59 + 30$

Find the missing number ... $\bullet - 38 = 78 - 40$
 (add 2 to 78 because 38 is 2 less than 40)

Answer: $80 - 38 = 82 - 40$

Find the missing numbers.

- (4) $49 + \underline{\quad} = 50 + 95$
- (5) $128 + 54 = 130 + \underline{\quad}$
- (6) $\underline{\quad} - 74 = 247 - 80$

Adding using columns

Add $34 + 1423 + 9 + 135 + 3482 = ?$

	1 1 2	34
Add $34 + 1423 + 9 + 135 + 3482 = ?$		1423
Rewrite the numbers in a column, lining up numerals with the same place value.		9
Add each column of numbers, starting with the right hand column.		135
		+ 3482
		5083

Rewrite these numbers in columns, then add.

- (7) $149 + 35 + 2087 + 6$ (8) $63 + 1609 + 374 + 56$

_____	_____
+	+
_____	_____
_____	_____



4 Addition & subtraction of decimals

Name: _____



Adding decimal numbers using columns

	2 1 1
	0.23
Add $0.23 + 14 + 9.4 + 135.3 + 3.485 = ?$	14.
Rewrite the numbers in a column, lining up the decimal points.	9.4
	135.3
Add each column of numbers, starting with the right hand column.	+ 3.485
	162.415

Rewrite these decimals in columns, then add.

- (1) $6.3 + 0.08 + 127 + 16.2$ (2) $1.3 + 140.9 + 27.4 + 51$

+	+

- (3) Last month, Sarah bought items worth the following ...

\$40.70, \$8.30, \$4.65,
\$169 and \$0.80



Work out how much she spent using column addition.

Subtracting decimals using columns & renaming

Subtract $46.3 - 2.58 = ?$ (Line up the decimal points)

$\begin{array}{r} 2 \ 10 \\ 46.\cancel{3}0 \\ - 2.58 \\ \hline 2 \quad .72 \end{array}$	$\begin{array}{r} 5 \ 12 \ 10 \\ 4\cancel{6}.\cancel{3}0 \\ - 2.58 \\ \hline .72 \end{array}$	$\begin{array}{r} 5 \ 12 \ 10 \\ 4\cancel{6}.\cancel{3}0 \\ - 2.58 \\ \hline 43.72 \end{array}$
---	---	---

... 30 is **renamed** as 20 & 10 ... ($10 - 8 = 2$).
 ... 62 is **renamed** as 50 & 12 ... ($12 - 5 = 7$).
 ... finally ... $5 - 2 = 3$ and $4 - 0 = 4$



Rewrite these numbers in columns, then subtract.

- (4) $95.9 - 49.5$ (6) $14.90 - 3.752$

-	-

- (5) $8.27 - 1.693$ (7) $159 - 36.75$

-	-

\$3.00 each	\$1.50 each	\$1.70 each	\$0.50 each

- (8) **Work out** the cost of buying ...
- 4 hamburgers, _____
- 3 gingerbread man, _____
- 2 orange juices _____
- and _____
- 4 ice-creams. _____

Total = \$ _____

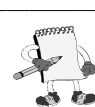
- (9) If you paid for the food with a \$50.00 note, how much change would you _____

\$189.90 each	\$342.70 each	\$169.50 each	\$39.50 each

- (10) **Work out** the cost of buying ...
- 2 chairs, _____
- 2 tables, _____
- 3 filing cabinets _____
- and _____
- 1 telephone _____

Total = \$ _____

- (11) If you had \$2000 to spend on office equipment, how much do you have left over? _____



The aim of this activity sheet is to use addition and subtraction strategies to workout problems involving decimals / money. Remember to line up decimal points.

Suggested extension activity:

Make up similar questions as on this worksheet, that involve adding and subtracting decimals. Ask your child to work out an estimated answer before they do the calculation.

Example: If I spend \$5.25, \$1.90, \$3.25 and \$9.90, how much have I spent and what change do I get from \$30.00?

Answer: Estimated answer ... $5 + 2 + 3 + 10 = 20$

Sign when completed: _____

When working with large numbers, there is more than one way to work out an answer. Here are some strategies.



Using place value

Working out 259×8 is the same as ...
 $(200 \times 8) + (50 \times 8) + (9 \times 8) = 1600 + 400 + 72 = 2072$

- (1) $167 \times 5 = (100 \times \underline{\quad}) + (60 \times \underline{\quad}) + (7 \times \underline{\quad})$
 $= \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$
- (2) $213 \times 6 = \underline{\quad}$
 $= \underline{\quad}$
- (3) $386 \times 7 = \underline{\quad}$
 $= \underline{\quad}$
- (4) $492 \times 8 = \underline{\quad}$
 $= \underline{\quad}$

Rounding to use 'tidy' numbers

Working out 298×5 is the same as ...
 $(300 \times 5) - (2 \times 5) = 1500 - 10 = 1490$



- (5) $597 \times 6 = (600 \times \underline{\quad}) - (3 \times \underline{\quad})$
 $= \underline{\quad} - \underline{\quad} = \underline{\quad}$
- (6) $790 \times 7 = \underline{\quad}$
 $= \underline{\quad}$
- (7) $607 \times 8 = (600 \times \underline{\quad}) + (7 \times \underline{\quad})$
 $= \underline{\quad} + \underline{\quad} = \underline{\quad}$
- (8) $805 \times 9 = \underline{\quad}$
 $= \underline{\quad}$

Using written working forms

To work out 95×8 , rewrite as ...



$$\begin{array}{r} 95 \\ \times 8 \\ \hline 760 \end{array}$$
 Firstly, $8 \times 5 = 40$
 (Note: small 4 represents 40)
 then, $90 \times 8 = 720$ plus $40 = 760$

- (9)
$$\begin{array}{r} 267 \\ \times 3 \\ \hline \end{array}$$
 (11)
$$\begin{array}{r} 349 \\ \times 7 \\ \hline \end{array}$$
- (10)
$$\begin{array}{r} 519 \\ \times 4 \\ \hline \end{array}$$
 (12)
$$\begin{array}{r} 269 \\ \times 8 \\ \hline \end{array}$$

More using written working forms

Using the same strategy as used for questions 9 to 12, work out 145×28 . Rewrite as ...



Step 1: $8 \times 5 = 40,$ $8 \times 4 = 32 + 4 = 36,$ $8 \times 1 = 8 + 3 = 11$	145 $\times 28$ <hr/> 1160 <hr/> 2900 <hr/> 4060	Step 2: Write in a zero as you are multiplying by 10's
Step 3: $2 \times 5 = 10,$ $2 \times 4 = 8 + 1 = 9,$ $2 \times 1 = 2$		
Step 4: Add each column of numbers.		

- (13)
$$\begin{array}{r} 637 \\ \times 25 \\ \hline \end{array}$$
 (15)
$$\begin{array}{r} 1456 \\ \times 68 \\ \hline \end{array}$$
- (14)
$$\begin{array}{r} 491 \\ \times 64 \\ \hline \end{array}$$
 (16)
$$\begin{array}{r} 3027 \\ \times 79 \\ \hline \end{array}$$

working space

- (17) Show your working as you work out this problem.
 At a large high school, four computer rooms are going to be set up.
 Each room will have 27 computers.
 If the cost of one computer is \$1295, how much will it cost to buy the computers?



The aim of this activity sheet is to look at different strategies that could be used to work out multiplication problems.

Suggested extension activity:

Make up similar questions that cover the basic numeracy facts at the back of this resource. These are **key number knowledge facts**.

The strategies used on this worksheet are only a suggestion. Your child may not need to use some or all of these strategies and may have strategies of their own. Encourage them to talk about how they work out their answers. Remember that working out the answer with confidence is more important than the strategy used.

Sign when completed: _____

6 Division strategies

Name: _____



When working with large numbers, there is more than one way to work out an answer. Here are some strategies.

Using known multiples of 10

Working out $95 \div 5$ is the same as ...
 $(50 \div 5) + (45 \div 5) = 10 + 9 = 19$



- (1) $96 \div 6 = (60 \div \underline{\quad}) + (36 \div \underline{\quad})$
 $= \underline{\quad} + \underline{\quad} = \underline{\quad}$
- (2) $133 \div 7 = \underline{\quad}$
 $= \underline{\quad}$
- (3) $136 \div 8 = \underline{\quad}$
 $= \underline{\quad}$
- (4) $162 \div 9 = \underline{\quad}$
 $= \underline{\quad}$

Rounding up or down to use 'tidy' numbers

Working out $195 \div 5$ is the same as ...
 $(200 \div 5) - (5 \div 5) = 40 - 1 = 39$



- (5) $776 \div 2 = (800 \div \underline{\quad}) - (24 \div \underline{\quad})$
 $= \underline{\quad} - \underline{\quad} = \underline{\quad}$
- (6) $2086 \div 7 = \underline{\quad}$
 $= \underline{\quad}$
- (7) $1845 \div 9 = (1800 \div \underline{\quad}) + (\underline{\quad} \div \underline{\quad})$
 $= \underline{\quad} + \underline{\quad} = \underline{\quad}$
- (8) $3216 \div 8 = \underline{\quad}$
 $= \underline{\quad}$

Halving factors

Working out $208 \div 16$ is the same as ...
 $104 \div 8 \dots 52 \div 4 \dots 26 \div 2 = 13$



- (9) $432 \div 12 = \underline{\quad} \div 6 = \underline{\quad} \div 3 = \underline{\quad}$
- (10) $192 \div 16 = \underline{\quad}$
- (11) $1280 \div 40 = \underline{\quad}$
- (12) $576 \div 24 = \underline{\quad}$

Using written working forms, some with & without remainders. To work out $97 \div 6$, rewrite as ...

Firstly, $9 \div 6 = 1$
 with a remainder of 3
 then $37 \div 6 = 6$
 with a remainder of 1

$$\begin{array}{r} 1 \\ 6 \overline{) 97} \\ \underline{6} \\ 37 \\ \underline{36} \\ 10 \\ \underline{6} \\ 4 \end{array}$$



- (13) $7 \overline{) 168}$ (16)
- (14) $7 \overline{) 943}$
- (15) $8 \overline{) 520}$
- (18) $8 \overline{) 1375}$
- (17) $9 \overline{) 1386}$
- (19) $9 \overline{) 1948}$

Work out the problems using any strategy you like.



- (19) $588 \div 6 =$ _____
- (20) $1200 \div 24 =$ _____
- (21) $153 \div 9 =$ _____
- (22) $1429 \div 8 =$ _____
- (23) The total cost of airfares for five adult fares came to \$1890. How much did each passenger pay? _____
- (24) Nine new computers cost \$22185. If they are all the same, what is the cost of one computer? _____



The aim of this activity sheet is to look at different strategies that could be used to work out division problems.

Suggested extension activity:

Make up similar questions that cover the basic numeracy facts at the back of this resource. These are **key number knowledge facts**. The strategies used on this worksheet are only a suggestion. Your child may not need to use some or all of these strategies and may have strategies of their own. Encourage them to talk about how they work out their answers. Remember that working out the answer with confidence is more important than the strategy used.

Sign when completed: _____

Using written working forms with decimals

To work out 14.5×2.8 , use the same strategy as if working with whole numbers.



Rewrite as ...

$$\begin{array}{r} 1.47 \\ \times 2.8 \\ \hline 1176 \\ 2940 \\ \hline 4.116 \end{array}$$

Where does the decimal point go in the answer?
By counting the digits to the right of the decimal point in the question, the position of the decimal point in the answer can be found.
Example: 3 digits to the right of the decimal points, so 3 in from the right.

Using written working forms with decimals

To work out $2.84 \div 0.4$, move the decimal point in 0.4 until you are dividing by a whole number.

Then move the decimal point the same number of places in the number being divided.

Example: $0.4 \overline{) 2.84} \longrightarrow 4 \overline{) 28.4}$

Work out the answer using the same strategies as if working with whole numbers.

(1) 3.69×0.4

(2) 1.864×0.05

(8) $0.08 \overline{) 5.20}$

(10) $0.06 \overline{) 83.46}$

(3) 148.2×0.17

(4) 4.975×6.4

(9) $0.07 \overline{) 0.574}$

(11) $0.9 \overline{) 0.3258}$

Adding zeros and rounding

With some division problems there appears to be no end. By adding extra zeros, you can keep dividing.

Example: $18.7 \div 7 = ?$

Round this answer to 2 decimal places.

$$\begin{array}{r} 0.26714 \text{ etc.} \\ 7 \overline{) 18.7000} \text{ etc.} \end{array}$$

Answer: 2.6714 rounded to 2 d.p. is 2.67

Work out the problems by adding zeros if needed, then round your answer to 2 decimal places.

(12) $0.8 \overline{) 12.3}$ _____ 2 d.p

(13) $0.09 \overline{) 0.32}$ _____ 2 d.p

(14) Seven C.D.'s cost \$111.65. If they all cost the same price, what is the cost of one C.D? 1 C.D. costs = \$ _____

(5) A travelling salesman recorded the distances he travelled each day.

He averaged 84.53km each day for 8 days.

Work out the total distance he would travel during this time.

(6) On another trip he averaged 92.75 each day for 14 days.

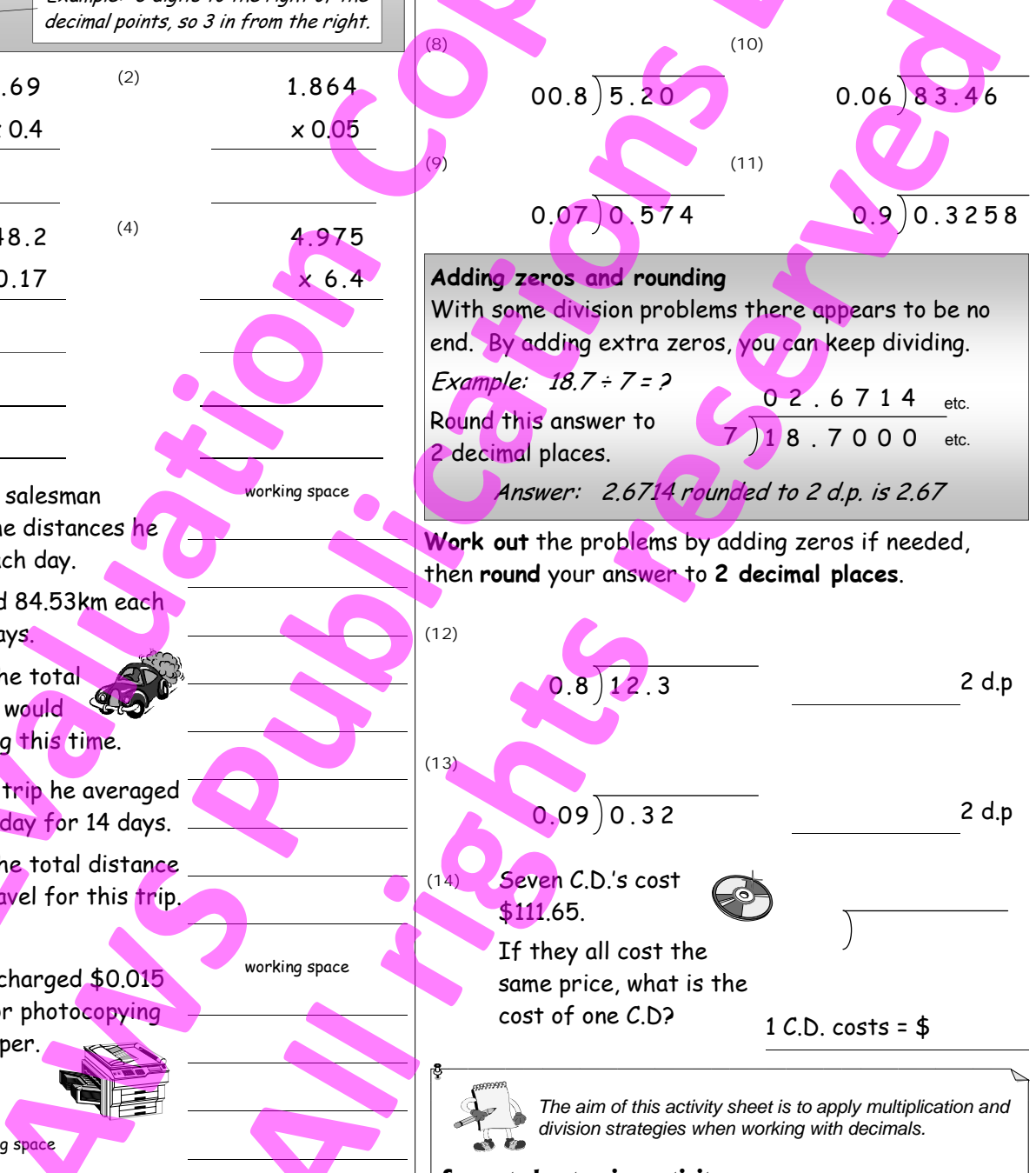
Work out the total distance he would travel for this trip.

(7) A school is charged \$0.015 per copy, for photocopying A4 sized paper.



working space

Work out the cost of copying 10298 and 25642 copies.



"Is the number 11 a **prime** number?"
 "Can you list the first 5 **multiples** of 6?"
 "Can you list the **factors** of 12?"

Prime numbers, multiples and factors are all special types of numbers.



When a number is multiplied by itself, such as ... 1×1 , 2×2 , 3×3 , 4×4 etc. the answers that are created are known **squares**.

These can be written as 1^2 , 2^2 , 3^2 , 4^2 , etc.
 We say, 4^2 as 'four squared', which means $4 \times 4 = 16$.



Use the words in the box to fill in the missing words in these sentences about **special numbers**.

factor, multiples, prime

- (1) A _____ number can only be divided by two numbers, itself and 1.
- (2) The _____ of a number are found by multiplying the number by 1, 2, 3, 4, 5, etc and recording the answers.
- (3) A _____ of a given number is a whole number that divides exactly into the given number. There is no remainder.

Working with prime numbers.

- (4) List the first 8 prime numbers. _____
- (5) List the prime numbers between 60 and 90. _____
- (6) Circle the prime numbers in this list.
 29, 31, 33, 35, 37, 39, 45, 47, 49, 51



Working with multiples.

Example: The multiples of 5 are ... 5, 10, 15, 20, 25, 30 etc.

- (7) List the first 10 multiples of 8. _____
- (8) List the multiples of 7 between 34 and 60. _____
- (9) List the multiples of 9 between 50 and 120. _____

Working with factors.

Example: 2 and 3 are factors of 6 as $2 \times 3 = 6$.

- (10) List the factors of 15. _____
- (11) List the factors of 36. _____
- (12) List the factors of 52. _____



Work out the squares of these numbers.

- (13) $7^2 =$ _____ (15) $9^2 =$ _____
- (14) $6^2 =$ _____ (16) $12^2 =$ _____
- (17) How many concrete tiles are needed to tile a square court yard if one side is 13 tiles long? _____

The opposite of squaring a number is to find the **square root**. The symbol for square root is $\sqrt{\quad}$.

Example: If $9 \times 9 = 81$, then $\sqrt{81} = 9$
 (i.e. two numbers the same that multiply to 81)



Work out the square root of these numbers.

- (18) $\sqrt{64} =$ _____ (20) $\sqrt{81} =$ _____
- (19) $\sqrt{121} =$ _____ (21) $\sqrt{400} =$ _____
- (22) A square court yard has 49 one metre square tiles. How long is each side? _____

Other powers.

If $9 \times 9 = 9^2 = 81$, then $9 \times 9 \times 9 = 9^3 = 729$

Example: Find 5^4 Answer: $5 \times 5 \times 5 \times 5 = 625$



Work out these powers.

- (23) 2^5 _____
- (24) 3^4 _____
- (25) 6^3 _____
- (26) 10^4 _____

The aim of this activity sheet is to understand how some special numbers are created - square and square roots.

Suggested extension activity:

Read out the definitions for the special numbers (Q1 to Q3) and ask your child to name the special numbers.
 Make up similar questions as on this worksheet.
 Example: What are the factors of 24? List the first 7 multiples of 9.
 Is 17 a prime number? What is 10 squared? What is the square root of 81? etc.

Sign when completed: _____

When working out answers with questions involving a mixture of operations, the order in which they are done will affect the answer. The letters **BODMAS** or **BEDMAS** will help you to remember the order.

- B** = brackets
- O** = of (**E** = exponents)
- D** = division
- M** = multiplication
- A** = addition
- S** = subtraction



Examples: $6 \times 8 + 12 = 48 + 12 = 60$ $13 + 4 \times 3 = 13 + 12 = 25$ $36 \div 4 - 7 = 9 - 7 = 2$ $10 + 27 \div 9 = 10 + 3 = 13$

Use order of operation rules to work out the following problems.

- (1) $6 \times 7 + 19 =$ _____
- (2) $9 \times 8 - 12 =$ _____
- (3) $55 \div 5 - 7 =$ _____
- (4) $15 + 54 \div 6 =$ _____
- (5) $85 - 8 \times 7 =$ _____
- (6) $96 \div 8 + 18 =$ _____
- (7) $57 - 4 \times 5 + 16 =$ _____
- (8) $64 - 32 \div 8 \times 6 =$ _____
- (9) $9 \times 8 \div 12 + 27 =$ _____
- (10) $7 \times 7 - 4 \times 6 =$ _____

Problems involving brackets.

Example: $3(5 + 4)$ means $3 \times (5 + 4) = 3 \times 9 = 27$
 $5(20 - 3 \times 6) = 5(20 - 18) = 5 \times 2 = 10$

Use order of operation rules to work out the answers for these questions involving brackets.

- (11) $2(4 \times 3 + 8) =$ _____
- (12) $5(30 - 3 \times 6) =$ _____
- (13) $6(36 \div 9 + 7) =$ _____
- (14) $3(4 \times 8 - 12) =$ _____
- (15) $9(12 - 45 \div 9) =$ _____
- (16) $3(5 \times 6 - 15) =$ _____

- (17) $14 + 2(14 - 2 \times 6) =$ _____
- (18) $30 - 2(18 \div 3 + 4) =$ _____
- (19) $27 + 3(3 \times 4 + 8) =$ _____
- (20) $81 - 5(3 + 54 \div 9) =$ _____

Problems involving brackets and exponents.

Example: $3^2 + 5 \times 4$ means $3 \times 3 + 5 \times 4 = 9 + 20 = 29$
 $5(4^2 - 2 \times 6) = 5(16 - 12) = 5 \times 4 = 20$

Use order of operation rules to work out the answers for these questions involving brackets and exponents.

- (21) $2(4 \times 3 + 8) =$ _____
- (22) $5(30 - 3 \times 6) =$ _____
- (23) $6(36 \div 9 + 3^2) =$ _____
- (24) $3(9^2 - 8 \times 7) =$ _____
- (25) $5(8 - 45 \div 9)^2 =$ _____

Add +, -, × or ÷ to make each statement true. Remember ...

BEDMAS

- (26) $6 _ 4 _ 9 = 33$
- (27) $25 _ 5 _ 3 = 10$
- (28) $18 _ 6 _ 7 = 10$
- (29) $7 _ 6 _ 8 _ 9 = 46$
- (30) $6 _ 7 _ 27 _ 9 = 39$



- (31) James had a holiday job that lasted 4 days less than 5 weeks. For how many days did he work?
- (32) Aimee bought 9 books worth \$8.00 each and 4 pens worth \$5.00 each. How much did she spend altogether?

The aim of this activity sheet is to understand order of operations when calculating answers involving the four operations and exponents.

Suggested extension activity:
 Make up similar number and word questions as on this worksheet that require using the order of operation rules.
 Example: If I buy five C.D.'s at \$15.00 each and a book worth \$12.50, how much have I spent?

Sign when completed: _____

Kerry cut his pie into 4 equal pieces.
Josh cut his pie into 12 equal pieces.



If Kerry ate $\frac{1}{4}$ of his pie, how many pieces of pie must Josh eat, so that he has eaten the same fraction of his pie?

Answer: 3 pieces of pie as $\frac{3}{12} = \frac{1}{4}$.

The fractions $\frac{1}{4}$ and $\frac{3}{12}$, are called **equivalent fractions**, as they represent the same part or fraction of a whole.



A smaller equivalent fraction can be created by dividing the top and bottom numbers of a fraction by the same number.



Example: $\frac{15}{20} \div \frac{5}{5} = \frac{15 \div 5}{20 \div 5} = \frac{3}{4}$.

Make smaller equivalent fractions by dividing each fraction by the numbers given.

(11) $\frac{10}{50} \div \frac{10}{10} = \frac{10 \div \underline{\quad}}{50 \div \underline{\quad}} = \underline{\quad}$

(12) $\frac{21}{28} \div \frac{7}{7} = \frac{\div}{\div} = \underline{\quad}$

(13) $\frac{24}{30} \div \frac{6}{6} = \frac{\div}{\div} = \underline{\quad}$

(14) $\frac{24}{40} \div \frac{8}{8} = \frac{\div}{\div} = \underline{\quad}$

(15) $\frac{45}{63} \div \frac{9}{9} = \frac{\div}{\div} = \underline{\quad}$



To simplify fractions means to make the fraction as small as possible.



Example: $\frac{24}{48} = \frac{12}{24} = \frac{6}{12} = \frac{3}{6} = \frac{1}{2}$

Simplify these fractions.

(16) $\frac{15}{30} = \underline{\quad}$

(21) $\frac{65}{95} = \underline{\quad}$

(17) $\frac{24}{36} = \underline{\quad}$

(22) $\frac{45}{81} = \underline{\quad}$

(18) $\frac{42}{48} = \underline{\quad}$

(23) $\frac{36}{54} = \underline{\quad}$

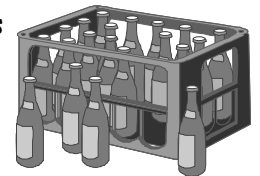
(19) $\frac{32}{40} = \underline{\quad}$

(24) $\frac{37}{100} = \underline{\quad}$

(20) $\frac{49}{70} = \underline{\quad}$

(25) $\frac{65}{100} = \underline{\quad}$

(26) What fraction of the bottles are in this crate? Simplify your answer.



The aim of this activity sheet is to understand that fractions can be represented by different numbers, but the fractions are still equivalent.

Suggested extension activity:

Using a collection of objects from around the house or money, create word problems that require your child to write a fraction that can then be simplified.

Example: If I have \$40 and spend \$20, what fraction did I spend? Simplify your answer. Answer: $\frac{20}{40} = \frac{1}{2}$

Sign when completed: _____

Part of the Group 1 shapes have been shaded in. Shade in the number needed in the Group 2 shapes to create equivalent fractions.

	Group 1 shapes	Group 2 shapes
(1)		
(2)		
(3)		
(4)		
(5)		

A larger equivalent fraction can be created by multiplying the top and bottom numbers of a fraction by the same number.



Example: $\frac{1}{3} \times \frac{4}{4} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$.

Make larger equivalent fractions by multiplying each fraction by the numbers given.

(6) $\frac{1}{2} \times \frac{7}{7} = \frac{1 \times \underline{\quad}}{2 \times \underline{\quad}} = \underline{\quad}$

(7) $\frac{2}{3} \times \frac{6}{6} = \frac{\underline{\quad}}{\underline{\quad}} = \underline{\quad}$

(8) $\frac{3}{4} \times \frac{9}{9} = \frac{\underline{\quad}}{\underline{\quad}} = \underline{\quad}$

(9) $\frac{2}{5} \times \frac{8}{8} = \frac{\underline{\quad}}{\underline{\quad}} = \underline{\quad}$

(10) $\frac{5}{8} \times \frac{7}{7} = \frac{\underline{\quad}}{\underline{\quad}} = \underline{\quad}$



"What's two thirds of \$27?" asked Andy.
Written as $\frac{2}{3}$ of 27 or $\frac{2}{3} \times 27$



"Firstly, divide 27 by 3 to find $\frac{1}{3}$, then multiply your answer by 2 to find $\frac{2}{3}$ ", said Tom. Answer: $27 \div 3 = 9$, then $9 \times 2 = 18$

Work out each fraction of these numbers.

- (1) Find $\frac{2}{5}$ of 50 = _____
- (2) Find $\frac{3}{4}$ of 72 = _____
- (3) Find $\frac{5}{7}$ of 84 = _____
- (4) Find $\frac{7}{8}$ of 64 = _____
- (5) Find $\frac{4}{9}$ of 72 = _____

- (6) Andy is $\frac{3}{4}$ of the way through a cross-country race. If the race is 6000m long, how far has he run so far?



$6000 \div \underline{\quad} = \underline{\quad} \times \underline{\quad} = \underline{\quad}$

- (7) Room 9 pupils are $\frac{2}{3}$ of the way through a 60 minute game of soccer. For how long have they been playing?



$60 \div \underline{\quad} = \underline{\quad} \times \underline{\quad} = \underline{\quad}$

- (8) A café has sold $\frac{3}{8}$ of the bread rolls available for sale that day. If there are 120 bread rolls available, how many has the café sold so far?



Find a whole, given a fraction.

Fifteen or $\frac{1}{2}$ of the Room 7 pupils went to the movies. How many pupils in Room 7.

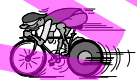


Answer: $2 \times \frac{1}{2} = 1$, if $\frac{1}{2} = 15$, then $2 \times 15 = 30$ pupils

- (9) Carol has read 42 pages or $\frac{1}{2}$ of her book. How many pages in this book?



- (10) Ken has covered 12km or $\frac{1}{4}$ of his bike ride. How far does he plan to ride?



- (11) Tom scored 24 runs or $\frac{1}{7}$ of the team total. How many runs did the team score?



- (12) Jackie spent \$6.50 or $\frac{1}{8}$ of her money. How much money did she have?



- (13) Pete has read 80 pages or $\frac{2}{3}$ of his book. How many pages in this book?

- (14) Sam has covered 27km or $\frac{3}{4}$ of his bike ride. How far does he plan to ride?

Fractions greater than 1.

$\frac{13}{2}$ is a fraction greater than one and is called an improper fraction.

Improper fractions can be rewritten as mixed numbers and vice versa.



Example: $\frac{13}{2} = 6\frac{1}{2}$ ($13 \div 2 = 6$ with 1 remainder)

$\frac{4^2}{3} = \frac{14}{3}$ ($4 \times 3 = 12$ plus 2 = 14)

Write these improper fractions as mixed numbers.

- (15) $\frac{17}{2} =$ _____
- (16) $\frac{25}{3} =$ _____
- (17) $\frac{18}{4} =$ _____
- (18) $\frac{21}{5} =$ _____
- (19) $\frac{28}{6} =$ _____
- (20) $\frac{47}{5} =$ _____
- (21) $\frac{58}{6} =$ _____
- (22) $\frac{65}{7} =$ _____
- (23) $\frac{75}{8} =$ _____
- (24) $\frac{65}{9} =$ _____

Write these mixed numbers as improper fractions.

- (25) $5\frac{1}{4} =$ _____
- (26) $6\frac{2}{3} =$ _____
- (27) $3\frac{3}{5} =$ _____
- (28) $7\frac{5}{6} =$ _____
- (29) $4\frac{5}{9} =$ _____
- (30) $3\frac{7}{8} =$ _____
- (31) $5\frac{3}{4} =$ _____
- (32) $7\frac{5}{9} =$ _____
- (33) $6\frac{6}{7} =$ _____
- (34) $9\frac{2}{3} =$ _____



The aim of this activity sheet is to revise calculations involving fractions, find a whole number given a fraction and convert between improper and mixed numbers.

Suggested extension activity:

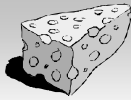
Make up similar number and word questions as on this worksheet that require working with fractions.

Example: Your pocket money each week is \$10. If you save $\frac{1}{4}$ of your pocket money, how much do you save?

At the end of a rugby match, there were $\frac{7}{4}$'s of oranges left over. How many oranges is that?

Sign when completed: _____

The top number of a fraction is called the **numerator**. The bottom number is called the **denominator**.



Fractions can be converted into **decimals**, by dividing the numerator by the denominator.

Example: Convert $\frac{3}{4}$ to a decimal.

$$\begin{array}{r} 0.75 \\ 4 \overline{) 3.00} \end{array}$$

Zeros will need to be added after the decimal point. You keep dividing until there is no remainder or there are at least 3 digits after the decimal point.

Convert these fractions to decimals.

- (1) $\frac{1}{4}$ (3) $\frac{2}{5}$
- $$\begin{array}{r} 1.00 \\ 4 \overline{) 1.00} \end{array}$$
- (2) $\frac{7}{10}$ (4) $\frac{3}{8}$

Decimals can be converted into **fractions**, with denominators of 10, 100, 1000 etc.

Example: Convert 0.5, 0.25 and 0.019 to fractions

Answers: $\frac{5}{10}$ $\frac{25}{100}$ $\frac{19}{1000}$

Some fractions can be simplified ...

$\frac{5}{10} = \frac{1}{2}$ and $\frac{25}{100} = \frac{5}{25} = \frac{1}{4}$



Convert these decimals to fractions. Simplify.

- (5) 0.4 $\frac{4}{10} =$ _____
- (6) 0.9 _____
- (7) 0.8 _____
- (8) 0.67 _____
- (9) 0.05 _____

Decimals can be converted into **percentages**, by multiplying the decimal by 100.

Example: Convert 0.5, 0.019 and 1.4 to percentages

Answers: $0.5 \times 100 = 50\%$, $0.019 \times 100 = 1.9\%$ and $1.4 \times 100 = 140\%$

Convert these decimals to percentages.

- (10) 0.6 $0.6 \times 100 =$ _____ %
- (11) 0.35 _____
- (12) 0.69 _____
- (13) 0.87 _____
- (14) 2.25 _____

Percentages can be converted into **decimals**, by dividing the percentage by 100.

Example: Convert 50%, 1.9% and 140% to decimals.

Answers: $50\% \div 100 = 0.5$, $1.9\% \div 100 = 0.019$ and $140\% \div 100 = 1.4$

Convert these percentages to decimals.

- (15) 60% $60 \div 100 =$ _____
- (16) 75% _____
- (17) 25% _____
- (18) 92% _____
- (19) 342% _____

Percentages are out of 100. **Percentages** can be converted to **fractions** with denominators of 100.

Example: Convert 40%, 74% and 9% to fractions

Answers: $\frac{40}{100} = \frac{2}{5}$, $\frac{74}{100} = \frac{37}{50}$ and $\frac{9}{100}$

Convert these percentages to fractions. Simplify.

- (20) 60% $\frac{60}{100} =$ _____
- (21) 75% _____
- (22) 94% _____
- (23) 17% _____
- (24) 125% _____

Fill in the missing fractions, decimals or percentages in the table below.



fraction	decimal	percentage
(25)	\leftrightarrow (26)	\leftrightarrow 50%
$\frac{1}{4}$	\leftrightarrow (27)	\leftrightarrow (28)
(29)	\leftrightarrow 0.75	\leftrightarrow (30)
(31)	\leftrightarrow (32)	\leftrightarrow $33\frac{1}{3}\%$
(33)	\leftrightarrow 0.6	\leftrightarrow (34)
$\frac{2}{3}$	\leftrightarrow (35)	\leftrightarrow (36)



The aim of this activity sheet is to understand that numbers can be expressed in different forms and to be able to convert between these different forms.

Suggested extension activity:

Using at least the fractions, decimals, percentages presented on this page, ask your child to convert between each form.

Example: Convert zero point five (0.5) to a fraction and a percentage. Convert sixty percentage (60%) to a decimal and a fraction. Convert one quarter to a percentage and a decimal etc...

Sign when completed: _____

Some of the **powers of 10** and the numbers they represent are listed below.

$$10^1 = 10, 10^2 = 100, 10^3 = 1000, 10^4 = 10000.$$

To multiply and divide by the powers of 10 is not as difficult as it might seem.

Examples: $1.5 \times 10000 = 15000$, $62.7 \times 100 = 6270$,
 $915.4 \div 100 = 9.154$, $4.2 \div 1000 = 0.0042$

In each example, the digits have remained the same, but the decimal point has moved.



(18) Look at the answers for the questions 10 to 17 involving division.

Can you **describe** a simple strategy for working out the answers without having to actually do the calculation?



Use your strategy to work out these questions.

(19) $2.7 \times 10^3 =$ _____

(20) $6.4 \div 10^5 =$ _____

(21) $9.2 \times 10^6 =$ _____

(22) $5.1 \div 10^1 =$ _____

(23) $8.3 \times 10^2 =$ _____

(24) $4.5 \div 10^3 =$ _____

(25) A brick fence is to be built using 10000 bricks.

Work out the cost (\$) of the bricks required, if each brick costs 25 cents.



(26) Photocopying on A4 sized paper cost 1.65 cents per copy. **Work out** the cost (\$) of printing 100000 copies.



(27) A box is full of 1000 balloons. The full box weighed 2.06kg and the empty box weighed 0.56kg. **Work out** the weight of the balloons and then the weight of ONE balloon.



Work out the following.

(1) $5.3 \times 100 =$ _____

(2) $2.7 \times 10000 =$ _____

(3) $85.6 \times 1000 =$ _____

(4) $0.26 \times 10 =$ _____

(5) $9.185 \times 1000000 =$ _____

(6) $562.3 \times 10000 =$ _____

(7) $4.2 \times 10^3 =$ _____

(8) $8.7 \times 10^5 =$ _____

(9) Look at the answers for the questions 1 to 8 involving multiplication. Can you **describe** a simple strategy for working out the answers without having to actually do the calculation?



Work out the following.

(10) $2.1 \div 100 =$ _____

(11) $25.3 \div 10000 =$ _____

(12) $6.78 \div 10 =$ _____

(13) $143.9 \div 1000 =$ _____

(14) $0.72 \div 100 =$ _____

(15) $7806.1 \div 100000 =$ _____

(16) $9.4 \div 10^4 =$ _____

(17) $7.6 \div 10^2 =$ _____



The aim of this activity sheet is to understand how to multiply or divide by a multiple of 10 and create a simple strategy to perform that task.

Suggested extension activity:

Make up similar number and word questions as on this worksheet that involve multiplying or dividing by multiples of 10.

Example: At the TWO Dollar Shop, a small toy costs the owner 35 cents each to purchase. What is the cost (in dollars) of 10,000 toys? If 100,000 small toys cost \$63,000, what does one toy cost?

Sign when completed: _____

Negative numbers are used in many situations.

Examples:

Last night there was a minus 5 degree frost.
My bank account is in overdraft by the sum of \$250.



Negative numbers are below zero and a small **negative sign** must be shown.

The frost is written as -5°C and the overdraft is written as $-\$250$.



Kate has a bank account that allows her to spend more money than she has in it. When she does, the account is in **overdraft** and has a **negative balance**.



(8) Below are Kate's details showing the withdrawals from her bank account and deposits into her bank account for the month of February.

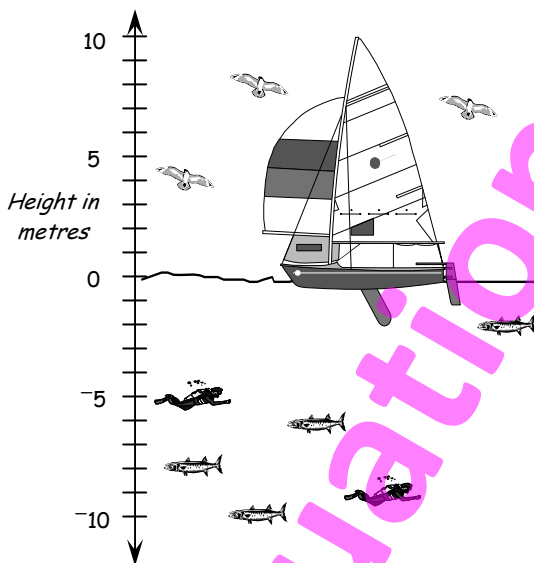
The opening balance was \$200.00.

Work out the new balance each day as money goes out of or into her account.



Date	Detail	Withdrawal	Deposits	Balance
31/1	Opening balance			\$200.00
5/2	bought new clothes	165.50		
8/2	wages from part-time job		115.60	
11/2	bought new bike	340.00		
15/2	wages from part-time job		115.60	
19/2	bought new clothes	43.75		
22/2	wages from part-time job		115.60	
28/2	Closing balance			

This diagram shows a sailing ship, two divers, some birds and some fish. The sea level is at zero on the scale drawn. The scale is in metres.



- What is the height of the mast above the sea level? _____
- Write the height of each bird above the sea level as positive numbers.
_____, _____, _____
- Draw another bird in the sky, 10 metres above the sea level.
- A diver is 9 metres below sea level. Write this depth as a negative number? _____
- What is the depth of the other diver? _____
- Write the depth of each fish as negative numbers.
_____, _____, _____, _____, _____

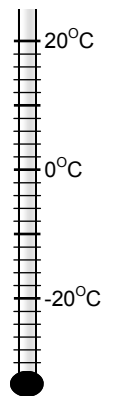
A diving sea bird is flying 8 metres above the sea. It then dives straight down 15 metres.

- Write the depth the bird reaches below the surface as a negative number. _____



Use the thermometer scale to work out the new temperature after the following changes.

- Start at 12°C drop 16°C _____
- Start at 0°C rise 17°C _____
- Start at 17°C drop 16°C _____
- Start at -8°C rise 13°C _____
- Start at -2°C drop 14°C _____



The aim of this activity sheet is to understand negative numbers occur below zero, as already discussed when working with temperature.

Suggested extension activity:

Using money totals, ask your child to subtract more from a given total, as would occur if you had an overdraft on a bank account.

Example: If you had \$50 in an account and spent \$75, what is the new balance of your account? Also do the reverse start with $-\$40$, add \$75 to your account ... what is the new balance?

Sign when completed: _____

To **solve** an equation means to **work out** the number that would go where the letter is.

Examples:

$29 + a = 73, \quad b + 19 = 45,$

$7c = 56$ (where $7c$ means $7 \times c$)



Remember that the total on either side of the equals sign, must be the same.

Use **any strategy** you like to **solve** these equations. Be prepared to talk about what strategy you used.



- | | | | |
|------|-----------------|-------|-------|
| (1) | $36 + a = 182$ | $a =$ | _____ |
| (2) | $239 - d = 167$ | $d =$ | _____ |
| (3) | $e + 94 = 536$ | $e =$ | _____ |
| (4) | $f - 87 = 346$ | $f =$ | _____ |
| (5) | $236 + m = 873$ | $m =$ | _____ |
| (6) | $412 - n = 329$ | $n =$ | _____ |
| (7) | $300p = 2700$ | $p =$ | _____ |
| (8) | $70q = 4900$ | $q =$ | _____ |
| (9) | $40s = 480$ | $s =$ | _____ |
| (10) | $5t = 1450$ | $t =$ | _____ |

Some equations involve a combination of operations.

Examples:

$3a + 5 = 23$	$5b - 7 = 43$
$3a = 23 - 5$	$5b = 43 + 7$
$3a = 18$	$5b = 50$
$a = 18 \div 3$	$b = 50 \div 5$
$a = 6$	$b = 10$



Solve these equations and show your working.

(11)	$6d + 3 = 51$	(13)	$8g - 29 = 43$
------	---------------	------	----------------

$d =$	$g =$
-------	-------

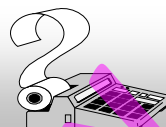
(12)	$7f + 13 = 97$	(14)	$9h - 69 = 21$
------	----------------	------	----------------

$f =$	$h =$
-------	-------

Some equations involve a combination of operations and brackets.

Examples:

$5(a + 2) = 45$	$2(a - 8) = 26$
$5a + 10 = 45$	$2a - 16 = 26$
$5a = 45 - 10$	$2a = 26 + 16$
$5a = 35$	$2a = 42$
$a = 35 \div 5$	$a = 42 \div 2$
$a = 7$	$a = 21$



Solve these equations and show your working.

(15)	$2(k + 3) = 28$	(16)	$8(g - 4) = 64$
------	-----------------	------	-----------------

$k =$ _____ $g =$ _____

Use **any strategy** you like to **solve** these equations. Be prepared to talk about what strategy you used.

working space

- | | | | |
|------|-----------------|-------|-------|
| (17) | $3(k - 8) = 21$ | $k =$ | _____ |
| (18) | $301 - m = 98$ | $m =$ | _____ |
| (19) | $9d + 18 = 72$ | $d =$ | _____ |
| (20) | $5(b + 4) = 90$ | $b =$ | _____ |

Read this word problem, write an equation and then work out the answer.



There may be more than one way to write the equation.

- (21) Liam plays cricket and this week he scored 7 less than 3 times as many runs as last week. If he scored 53 runs this week, how many runs (r) did he score last week?



Equation: _____

The aim of this activity sheet is to revise simple algebra skills to solve equations and introduce methodical methods to solve equations using $+$ / $-$ and \times / \div numeracy facts.

Suggested extension activity:

Make up similar questions as on this worksheet. Ask your child to solve (work out) each equation using the formal strategies as used on this worksheet or let them solve the equation using any strategy they come up with.

Ask your child to explain their strategy, if it differs from the methods on this worksheet.

Sign when completed: _____

16 Using formulae

Name: _____



A **formula** is like a **rule** and can be used to work things out.



Example: A formula to work out the cost of buying any number of C.D.'s costing \$9.00 each would be ...

$$C = \$9n \quad (C = \text{total cost, } n = \text{Number of C.D. purchased.})$$

Using this formula, 5 C.D.'s would cost \$45.00

A shop sells packets of raisins for \$1.20 each.

The cost of buying packets of raisins is shown in this table.

Number of packets	Total cost
0	\$0.00
1	\$1.20
2	\$2.40
5	\$6.00
10	\$12.00
15	
20	
50	
90	

(1) Write a **formula** to work out the cost (C) of buying packets of raisins (r).

(2) Use your **formula** to work out the cost of buying 15, 20, 50 and 90 packets of raisins.

Some **formula** are more complicated.

Example: The cost of buying C.D.'s by mail order is \$8.00 each, plus postage of \$10.00.



A **formula** to work this out could be ... $C = \$8n + \10

(Where C = total cost, n = Number of C.D.'s purchased.)

Using this **formula**, what is the cost of buying 5, 9 and 12 C.D.'s?

Answers: Replace n with 5, 9 & 12, then work out answers.

$C = 8 \times 5 + 10$	$C = 8 \times 9 + 10$	$C = 8 \times 12 + 10$
$C = 40 + 10$	$C = 72 + 10$	$C = 96 + 10$
$C = \$50$	$C = \$82$	$C = \$106$

(3) Sarah is going to buy some books that cost \$15.00 each. She has been given a gift voucher worth \$20.00. The cost of buying books is given by the formula or rule ... $C = \$15b - \20



(Where C = total cost, b = Number of books purchased.)

Use this formula to work out the cost of buying 3, 8 and 10 books.

3 books: _____

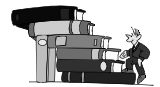
8 books: _____

10 books: _____

(4) If Sarah spent \$70.00 on books, how many did she buy?

Sam can buy books by mail order. There is always a \$10.00 postage charge with every order.

This graph shows the cost of buying books by mail order.



Use the graph to answer these questions.

- (5) If you spent \$22.00 and \$46.00 on books, how many books did you buy?

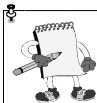
- (6) How much does it cost to buy 10 books, including postage.

- (7) How much does it cost to buy 10 books, without the postage charge?

- (8) What does one book cost, without postage?

- (9) Write an equation that you could use to work out the cost of ordering any number of books by mail order. Let n = number of books.

- (10) Use your **equation** to work out the cost of buying 9, 13 and 25 books.
9 books: _____
13 books: _____
25 books: _____



The aim of this activity sheet is to use or create a formula or rule to work out everyday problems.

Suggested extension activity:

Make up similar questions as on this worksheet. Ask your child to work out each problem using the formal strategies as used on this worksheet or let them solve the problem using any strategy they come up with.

Ask your child to explain their strategy, if it differs from the methods on this worksheet.

Sign when completed: _____

17 Number patterns or sequences

Name: _____



As people enter a party, they are given a spot prize ticket numbered from 1 to 50.



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	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Kate's lucky number is 4, so he started with the 4th person who got the first spot prize. He then selects every 7th person, who also gets a spot prize.

- On the grid above, circle all ticket numbers that will receive a prize.
- List the number sequence you created.

(3) How many spot prizes were won? _____

(4) A scoop of chips cost \$1.65.
Work out the number sequence that shows the cost of buying 1, 2, 3, 4 and 5 scoops of chips.



(5) How many scoops of chips can you buy with \$13.20? _____

(6) How many scoops of chips can you buy with \$19.80? _____

Some number patterns or sequences can be created by using a rule. Rules can involve more than one operation (+, -, × or ÷). Sequence numbers are called terms (n).

Example: Use the rule 'Multiply by 3, then add 5' create the first 4 terms of the number sequence.

Answers:

1st term: $1 \times 3 + 5 = 8$

2nd term: $2 \times 3 + 5 = 11$

3rd term: $3 \times 3 + 5 = 14$

4th term: $4 \times 3 + 5 = 17$



The first 4 terms in this sequence are 8, 11, 14 & 17.

For each word rule, work out the first 5 numbers in this sequence and write your answers in the tables.

(7) Rule = Multiply by 3, then add 7

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(8) Rule = Multiply by 4, then subtract 3

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(9) Rule = Multiply by 5, then add 2

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(10) Rule = Multiply by 7, then subtract 4

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

For each rule, work out the first 5 numbers in this sequence and write your answers in the tables.

(11) Rule: $S = 4n + 9$

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(12) Rule: $S = 42 - 5n$

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(13) Rule: $S = 7n + 2$

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(14) Rule: $S = 2n - 5$

Terms (n)	1	2	3	4	5
Sequence numbers (S)					

(15) A number sequence is created using the rule ...

$S = 9n - 12$

Find the following terms in this sequence.

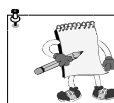
5th term: _____

12th term: _____

20th term: _____

100th term: _____

(16) What term (n) in the sequence has a value of 438? _____



The aim of this activity sheet is to create number patterns or sequences by using a rule.

Suggested extension activity:

Using everyday examples, create your own number patterns by adding or subtracting a constant number from a starting number. Ask your child to work out and describe how the pattern was created.

Example: If a hamburger costs \$3.50, work out the cost of buying 1, 2, 3, 4, 5 up to 10 hamburgers to create a number sequence.

Sign when completed: _____

In the metric system, the **metre** is the basic unit for **measuring length**.



A metre is about the length of a long stride or about 3 times the length of this page (A4 size).

- (1) **Name 5 objects** you could measure using the **metre** as the unit of length.

Metric units for measuring length.

kilometre	1000 times longer than a metre
metre	standard unit for length
centimetre	100 times shorter than a metre
millimetre	1000 times shorter than a metre

Name 2 objects or distances you could measure using the following units for length.

- (2) kilometres

- (3) centimetres

- (4) millimetres

Converting between measurement units.

1 metre (m) = 1000 millimetres (mm)
1 metre (m) = 100 centimetres (cm)
1 centimetre (cm) = 10 millimetres (mm)
1 kilometre (km) = 1000 metres (m)



Converting between metric length units.

- (5) 1.8m = _____ mm (13) 15mm = _____ cm
- (6) 4.25m = _____ mm (14) 135mm = _____ cm
- (7) 7200mm = _____ m (15) 14cm = _____ mm
- (8) 4280mm = _____ m (16) 57.2cm = _____ mm
- (9) 7.1m = _____ cm (17) 4100m = _____ km
- (10) 3.95m = _____ cm (18) 8430m = _____ km
- (11) 420cm = _____ m (19) 3.2km = _____ m
- (12) 575cm = _____ m (20) 9.54km = _____ m

When adding and subtracting length measurements, the '**units**' must be the **same**.

Example: Sam has two pieces of wood. One is 75cm long and the other is 2.9m long. What is the total length of wood in metres?

Answer: 0.75m + 2.9m = 3.65m



Answer these questions in the metric units stated.

(21) 800m + 5.3km + 750cm = ? (answer in metres)

(22) 85cm x 9 = ? (answer in metres)

(23) 910mm - 64.9cm = ? (answer in millimetres)

(24) 740cm - 5.8m = ? (answer in centimetres)

(25) 3500m + 6.1km + 940m = ? (answer in kilometres)

(26) 124.7cm - 805mm = ? (answer in millimetres)

(27) 3.7m + 83cm + 520mm = ? (answer in centimetres)

(28) 8430m - 7.95km = ? (answer in kilometres)

- (29) Kylie has a ball of string that is 20m long. She cuts off three pieces that are 3.5m, 1250mm and 95cm long. How many metres of string does she have left?



- (30) Evan is making a bookcase as shown in this diagram. **Work out** the total length of wood required and answer in metres.



The aim of this activity sheet is to convert between the most commonly used metric units for length or distances - i.e. metres, millimetres and kilometres.

Suggested extension activity:

Demonstrate how long a metre is and ask your child to name at least 5 objects or distances that can be measured using each length unit (mm, cm, m & km).

Ask your child to convert between units as above in Q5 to Q20 and add or subtract lengths presented in different units, such as in Q21 to Q28.

Sign when completed: _____

In the metric system, the **gram** is the basic unit for **measuring weight**.

A gram is a small weight. A packet of rice crackers weighs about 100 grams.



When adding and subtracting weight measurements, the 'units' must be the **same**.

Joe has two piles of books, one weighs 9600g and the other weighs 14.7kg.

What is the total weight of books in kilograms? Answer: $9.6\text{kg} + 14.7\text{kg} = 24.3\text{kg}$



- (1) Name 5 objects you could measure using the gram as the unit of weight.
- _____
- _____

Metric units for measuring weight.

tonne	1000 times heavier than a kilogram
kilogram	1000 times heavier than a gram
gram	standard unit for weight
milligram	1000 times lighter than a gram

Name 2 objects you could measure using the following units for weight.

- (2) tonne
- _____

- (3) kilogram
- _____

- (4) milligram
- _____

Converting between measurement units.

1 gram (g) = 1000 milligrams (mg)

1 kilogram (kg) = 1000 grams (g)

1 tonne (t) = 1000 kilograms (kg)



Converting between metric weight units.

(5) $8.7\text{g} = \underline{\hspace{2cm}}\text{mg}$ (13) $862\text{g} = \underline{\hspace{2cm}}\text{kg}$

(6) $9.32\text{g} = \underline{\hspace{2cm}}\text{mg}$ (14) $2.7\text{kg} = \underline{\hspace{2cm}}\text{g}$

(7) $0.65\text{g} = \underline{\hspace{2cm}}\text{mg}$ (15) $9.07\text{kg} = \underline{\hspace{2cm}}\text{g}$

(8) $6100\text{mg} = \underline{\hspace{2cm}}\text{g}$ (16) $0.56\text{kg} = \underline{\hspace{2cm}}\text{g}$

(9) $4280\text{mg} = \underline{\hspace{2cm}}\text{g}$ (17) $3200\text{kg} = \underline{\hspace{2cm}}\text{t}$

(10) $750\text{mg} = \underline{\hspace{2cm}}\text{g}$ (18) $7250\text{kg} = \underline{\hspace{2cm}}\text{t}$

(11) $8200\text{g} = \underline{\hspace{2cm}}\text{kg}$ (19) $4.9\text{t} = \underline{\hspace{2cm}}\text{kg}$

(12) $1760\text{g} = \underline{\hspace{2cm}}\text{kg}$ (20) $6.65\text{t} = \underline{\hspace{2cm}}\text{kg}$

Answer these questions in the metric units stated.

(21) $7000\text{mg} + 9.5\text{g} + 0.43\text{kg} = ?$ (answer in grams)

(22) $6300\text{g} - 3.9\text{kg} = ?$ (answer in kilograms)

(23) $12.4\text{t} - 8750\text{kg} = ?$ (answer in tonnes)

(24) $6.8\text{kg} - 4920\text{g} = ?$ (answer in grams)

(25) $9180\text{mg} - 3.8\text{g} = ?$ (answer in milligrams)

(26) $0.85\text{kg} + 264\text{g} + 4100\text{mg} = ?$ (answer in grams)

(27) $630\text{g} \times 9 = ?$ (answer in kilograms)

(28) $5.4\text{g} \div 9 = ?$ (answer in milligrams)

- (29) A baker buys flour in large bags that weigh 24kg each. If a loaf of bread uses 400g of flour, how many loaves of bread can be made from one large bag of flour?



- (30) On a truck there were 5 large rocks weighing 523kg, 274kg, 350kg, 495kg and 1.16t. What is the total weight of all these rocks? Answer in tonnes.



The aim of this activity sheet is to convert between the most commonly used metric units for weight - i.e. grams, milligrams, kilograms and tonnes.

Suggested extension activity:

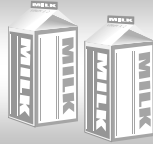
Use kitchen scales to demonstrate how light a gram is or some other object of a known weight. Then, using different sized objects, ask your child which unit for weight would be the best unit to use.

Ask your child to convert between units as above in Q5 to Q20 and add or subtract weights presented in different units, such as in Q21 to Q26.

Sign when completed: _____

In the metric system, the **litre** is the basic unit for **measuring volume**.

A litre is about 4 cups of water or the size of some milk or juice cartons.



- (1) **Name 5 objects** you could measure using the **litre** as the unit of volume.

Metric units for measuring volume.

kilolitre	1000 times more volume than a litre
litre	standard unit for volume
millilitre	1000 times less volume than a litre

Name 2 objects you could measure using the following units for **volume**.

- (2) kilolitre

- (3) millilitre

Converting between measurement units.

1 litre (L) = 1000 millilitres (mL)

1 kilolitre (kL) = 1000 litres (L)



Converting between metric volume units.

(4) $7.5L = \underline{\hspace{2cm}} mL$ (10) $2700L = \underline{\hspace{2cm}} kL$

(5) $1.84L = \underline{\hspace{2cm}} mL$ (11) $3950L = \underline{\hspace{2cm}} kL$

(6) $0.625L = \underline{\hspace{2cm}} mL$ (12) $480L = \underline{\hspace{2cm}} kL$

(7) $5300mL = \underline{\hspace{2cm}} L$ (13) $7.5kL = \underline{\hspace{2cm}} L$

(8) $4180mL = \underline{\hspace{2cm}} L$ (14) $9.23kL = \underline{\hspace{2cm}} L$

(9) $375mL = \underline{\hspace{2cm}} L$ (15) $0.354kL = \underline{\hspace{2cm}} L$

- (16) How many litres of juice is 6850mL?

- (17) How many millilitres of juice is 5.5L?

- (18) How many litres of juice is 750mL?



When adding and subtracting volume measurements, the '**units**' must be the **same**.

Example: Sam has two tins of paint, one holds 850mL and the other holds 10L.

What is the total volume of paint in litres?

Answer: $0.85L + 10L = 10.85L$



Answer these questions in the metric units stated.

(19) $0.6kL + 7100mL + 3.72L = ?$ (answer in litres)

(20) $7.35kL - 3700L = ?$ (answer in kilolitres)

(21) $8350mL - 7.8L = ?$ (answer in millilitres)

(22) $9.35L - 6930mL = ?$ (answer in litres)

(23) $8.49L - 5360mL = ?$ (answer in millilitres)

(24) $4.9kL + 3100L + 1900mL = ?$ (answer in litres)

(25) $580L \times 6 = ?$ (answer in kilolitres)

(26) $7280mL \div 8 = ?$ (answer in litres)

- (27) Alana bought four tins of paint. A 500mL, 4L and 10L container and a small 25mL test pot. How many litres of paint did she buy?



- (28) A large water cooler in an office holds 30L. How many 200mL cups of water can be drawn from the water cooler before it is emptied?

- (29) A swimming pool holds 25,000L, but has lost 1.2kL of water because of a leak. How much water is left in the pool? Answer in kilolitres



The aim of this activity sheet is to convert between the most commonly used metric units for volume - i.e. litres, millilitres and kilolitres.

Suggested extension activity:

Using some containers or measuring jugs, demonstrate how much liquid is needed to fill a 1 litre container. Using different sized containers, ask your child which unit for volume would be the best unit to use.

Ask your child to convert between units as above in Q4 to Q15 and add or subtract volumes presented in different units, such as in Q19 to Q26.

Sign when completed: _____

"Turn **clockwise!**" said Geoff,
"Not that way, the other way!"



"What angle size is that?" asked Ken.
"Acute, obtuse or reflex?"

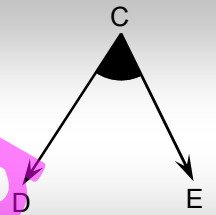
"Are these two lines **parallel** or **perpendicular**?" asked Alf.



Do you understand the meaning of these and other geometric words?



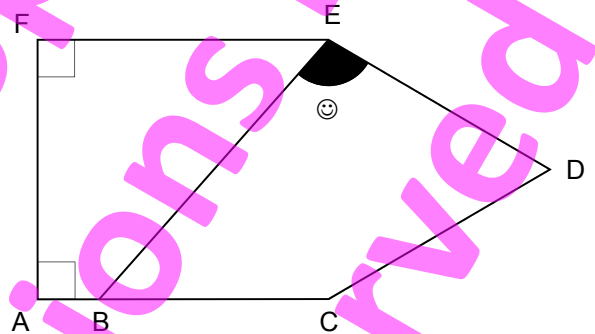
A diagram of an angle is made up of two lines (CD & CE) and a point where the lines meet (C).



This angle can be named using the three letters.

Example: $\angle DCE$ or $\angle ECD$,
where the \angle symbol means angle.

Look at this diagram.



Use the words in the box opposite to **complete** these sentences.

- acute
- angle
- anti-clockwise
- clockwise
- compass
- degrees
- obtuse
- parallel
- protractor
- perpendicular
- reflex
- right
- ruler
- straight

- (1) This arrow is pointing in a _____ direction.
- (2) This arrow is pointing in an _____ direction.
- (3) An _____ is a measure of turn.
- (4) Angle size is measured in _____.
- (5) A _____ is used to measure angle size.
- (6) A _____ is used to draw circles.
- (7) A _____ is used to draw and measure straight lines.
- (8) An angle that is 90° or a $\frac{1}{4}$ turn is called a _____ angle.
- (9) An angle that is 180° or a $\frac{1}{2}$ turn is called a _____ angle.
- (10) An _____ angle is greater than 0° but less than 90° .
- (11) An _____ angle is greater than 90° but less than 180° .
- (12) A _____ angle is greater than 180° but less than 360° .
- (13) Two lines that cross at right angles are _____.
- (14) Two lines that are the same distance apart are _____.

(15) Name the angle marked with a ☺.

(16) On the diagram, mark $\angle EBC$ with an X.

(17) Name two lines that are **perpendicular**.

(18) Name two lines that are **parallel**.

(19) Name at least one

acute angle _____

right angle _____

obtuse angle _____

(20) On the diagram, mark a reflex angle with the letter Y.

(21) Do the letters on this diagram label the corners in a clockwise or anti-clockwise direction?



The aim of this activity sheet is to understand geometric words and use these words to name angles, angle sizes and types of lines.

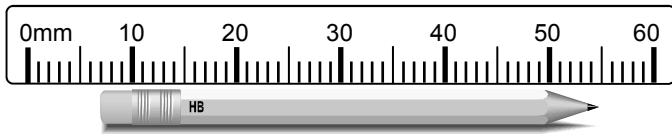
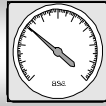
Suggested extension activity:

Look around your house and ask your child to identify geometric features associated with the words used in this worksheet.

Example: Is the pattern on the wall-paper in a clockwise direction? Point to two parallel lines in this picture. Open the door so that it forms an acute angle with the door frame. Point to two lines on the wall that are perpendicular. What angle does the wall and ceiling create where they meet? ... etc.

Sign when completed: _____

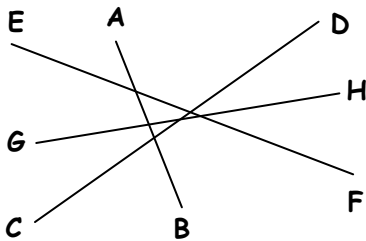
All measurement instruments have a **scale**. Being able to read the scale correctly is an important skill.



(1) How long is this pencil? Answer in mm & cm.

_____ mm is the same as _____ cm

(2) Measure these lines to the nearest millimetre.



Line AB = _____ mm

Line CD = _____ mm

Line EF = _____ mm

Line GH = _____ mm

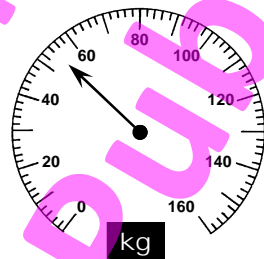
(3) Draw a 7.2cm line in the space below starting at point X.



This diagram of a weighing machine's scale shows the weight of a block.



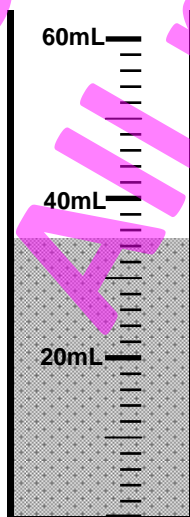
(4) What is the weight of the block?



(5) If a 49kg block is added to the scales, what is the new weight?

(6) Draw an arrow on this scale to show 158kg.

This diagram of a measuring cylinder has some water in it.



(7) What are the units on the scale on this container?

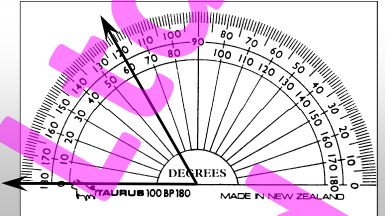
(8) What is the volume of water in the container?

(9) Another 17mL of water is added to the container.

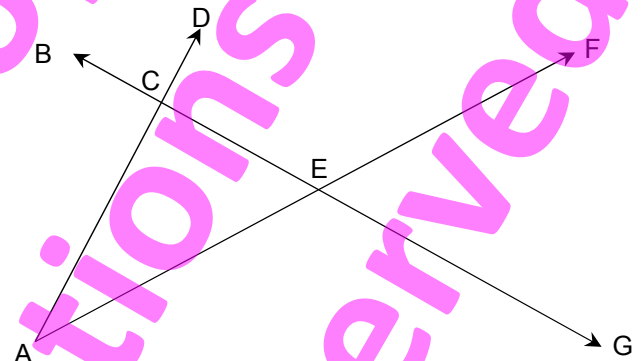
Draw the new water level.

The instrument for measuring and drawing angles is called a **protractor**. There are two scales on a protractor that you can use.

Example: Which scale do you use and what is the size of the angle drawn below?



Answer: Inside scale and 60° (60 degrees)



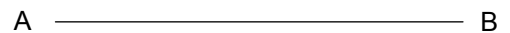
Use a protractor to measure these angles.

(10) $\angle CAE =$ _____ (12) $\angle BEA =$ _____

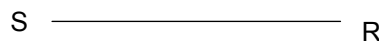
(11) $\angle GEA =$ _____ (13) $\angle FEB =$ _____

Using the line already drawn, draw the following angles to the nearest degree, using a protractor.

(14) $\angle ABC = 50^\circ$



(15) $\angle SRT = 105^\circ$



The aim of this activity sheet is to read scales, measure & draw lines or angles using the appropriate equipment. Remember to measure from zero on the ruler, not the end.

Suggested extension activity:

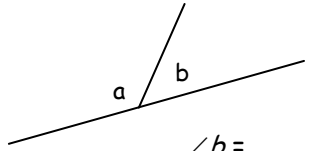
Find a collection of objects from around the house that can be measured using a ruler or tape measure, kitchen or bathroom scales, or measuring jugs. Ask your child to measure various objects using the appropriate instruments, including drawing and measuring angles.

Example: The width of a door is about 800mm, a cup holds 250mL ...

Sign when completed: _____

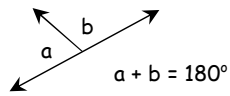
- (1) Measure the 2 angles on this straight line.

$\angle a = \underline{\hspace{2cm}}$ $\angle b = \underline{\hspace{2cm}}$



- (2) Do the 2 angles add to 180° . _____

Adjacent angles on a straight line add up to 180°

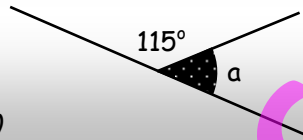


Example:

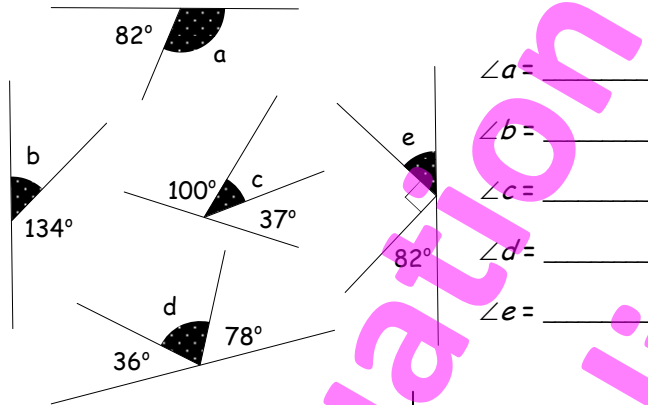
What is the size of $\angle a$?

Answer: $a + 115^\circ = 180^\circ$

$a = 65^\circ (180^\circ - 115^\circ)$

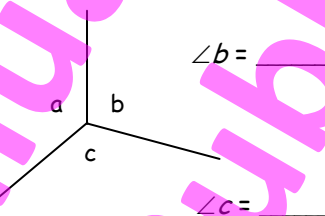


- (3) Work out the size of the missing angles.
(Note: Diagrams are not drawn to scale, so do not measure.)



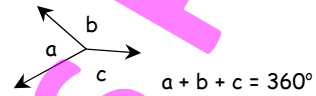
$\angle a = \underline{\hspace{2cm}}$
 $\angle b = \underline{\hspace{2cm}}$
 $\angle c = \underline{\hspace{2cm}}$
 $\angle d = \underline{\hspace{2cm}}$
 $\angle e = \underline{\hspace{2cm}}$
 $\angle f = \underline{\hspace{2cm}}$
 $\angle g = \underline{\hspace{2cm}}$

- (4) Measure the 3 angles around this point.
 $\angle a = \underline{\hspace{2cm}}$ $\angle b = \underline{\hspace{2cm}}$ $\angle c = \underline{\hspace{2cm}}$



- (5) Do the 3 angles add to 360° . _____

Angles around a point add to 360°

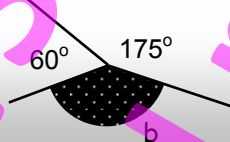


Example:

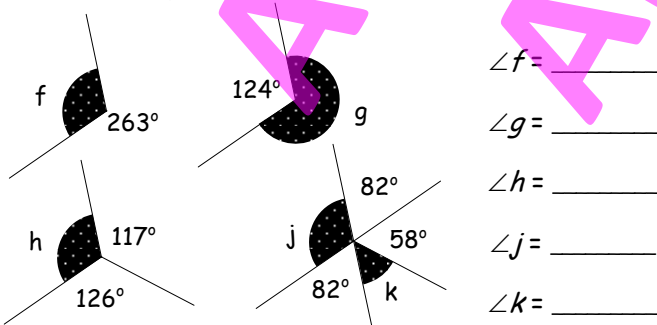
What is the size of $\angle b$?

Answer: $b + 60^\circ + 175^\circ = 360^\circ$

$b = 125^\circ (360^\circ - 60^\circ - 175^\circ)$



- (6) Work out the size of the missing angles.
(Note: Diagrams are not drawn to scale, so do not measure.)

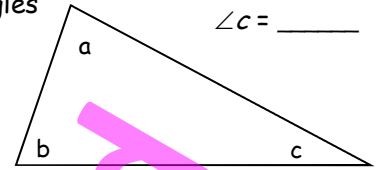


$\angle f = \underline{\hspace{2cm}}$
 $\angle g = \underline{\hspace{2cm}}$
 $\angle h = \underline{\hspace{2cm}}$
 $\angle j = \underline{\hspace{2cm}}$
 $\angle k = \underline{\hspace{2cm}}$
 $\angle l = \underline{\hspace{2cm}}$

- (7) Measure the 3 angles in this triangle. $\angle c = \underline{\hspace{2cm}}$

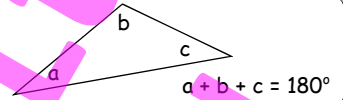
$\angle a = \underline{\hspace{2cm}}$

$\angle b = \underline{\hspace{2cm}}$



- (8) Do the 3 angles add to 180° . _____

Angles in a triangle add up to 180°

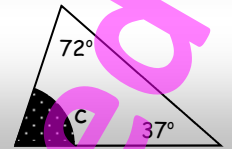


Example:

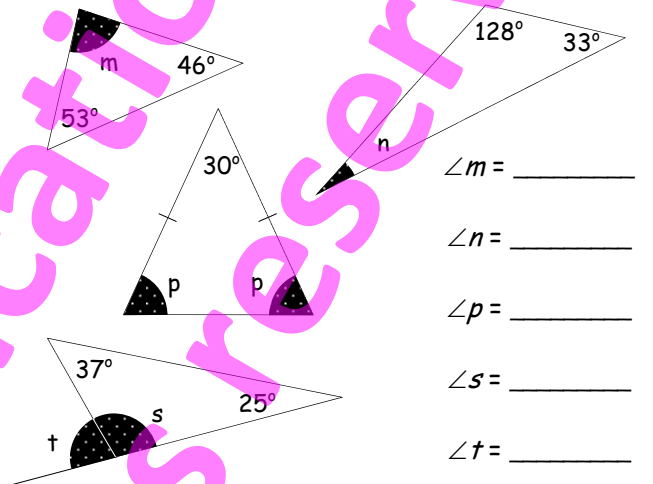
What is the size of $\angle c$?

Answer: $c + 72^\circ + 37^\circ = 180^\circ$

$c = 71^\circ (180^\circ - 72^\circ - 37^\circ)$



- (9) Work out the size of the missing angles.
(Note: Diagrams are not drawn to scale, so do not measure.)



$\angle m = \underline{\hspace{2cm}}$
 $\angle n = \underline{\hspace{2cm}}$
 $\angle p = \underline{\hspace{2cm}}$
 $\angle s = \underline{\hspace{2cm}}$
 $\angle t = \underline{\hspace{2cm}}$

- (10) A ladder is leaning against a building and makes an angle with the ground of 75° . What angle does the top of the ladder make with the building?



- (11) Work out the smaller of the two angles that the hands of this clock make.



The aim of this activity sheet is to revise using a protractor and use angle rules to find the size of missing angles.

Suggested extension activity:

Create diagrams similar to those on this worksheet. Ask your child to measure the missing angles using a protractor and also work out their size by using any of the three rules on this work sheet. The answers should be the same.

Example: Draw a triangle ... measure all three angles, which should add up to 180° .

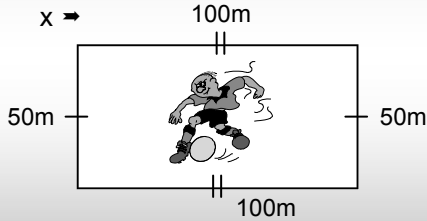
Sign when completed: _____

Distance around the outside.

Imagine you are at the corner of a soccer field. If you walk along each side and back to your starting point, the distance you have walked is called the **perimeter** of the field.

Example:

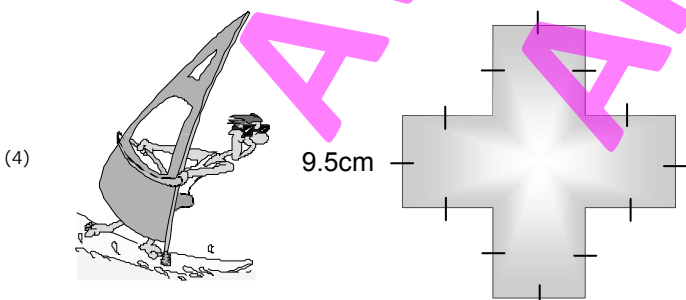
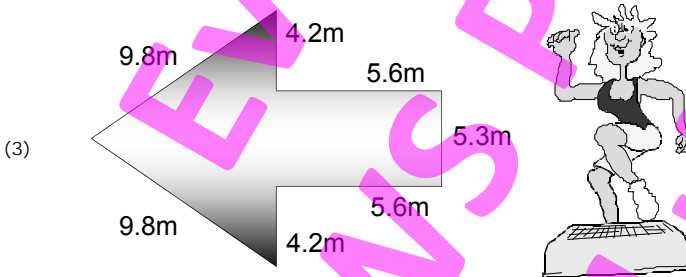
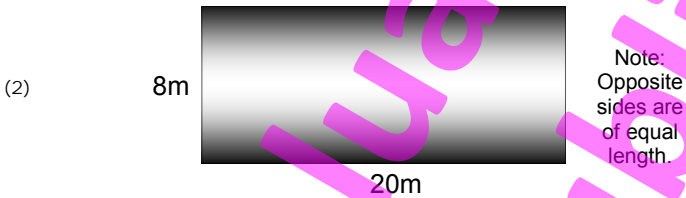
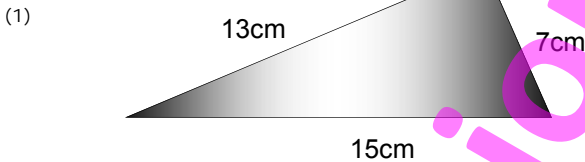
Add the length of ALL sides.



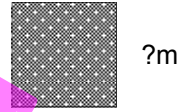
Answer: 300m

The same number of small lines on each side means that the sides are the same length, i.e. opposite sides are equal.

Look at each shape below and **work out the perimeter**. Remember to include all sides.



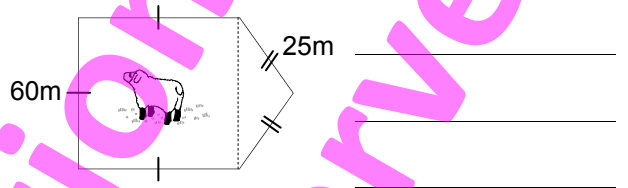
(5) All sides of a square are the same length. If the perimeter of a square is 48 metres, how long is each side?



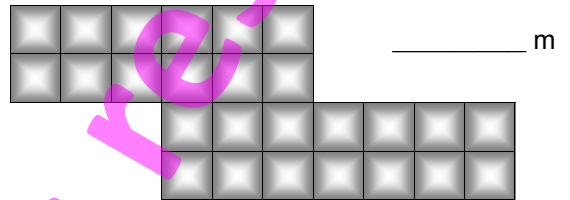
(6) A new fence, the shape of a rectangle, is to be built around a swimming pool. If the sides are 5 and 12 metres long, what is the perimeter of the fence?



(7) This diagram shows the fences around a paddock. Work out the perimeter of this paddock.

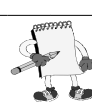
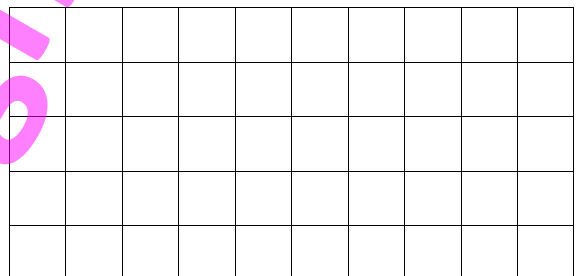


(8) A courtyard has been built using 1 metre concrete squares, as shown in this diagram. Work out the perimeter of the courtyard.



(9) On the grid below, shade in squares to create an L shaped courtyard design that has a perimeter of exactly 28 metres.

Note: The squares are 1 metre squares.



The aim of this activity sheet is to revise perimeter, 'the distance around the outside'. All closed 2D shapes, with the starting and finishing point the same, have a perimeter.

Suggested extension activity:

Find some shapes around your house, for which you can work out the perimeter.

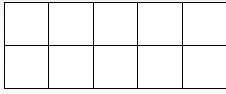
Example: The edge of a table, the boundaries of your properties, etc. where the starting and finishing points are in the same place.

Ask your child to measure ALL sides of the shape using a tape measure, ruler or their own feet. By adding up all measurements, you are working out the perimeter of each shape.

Sign when completed: _____

"If you can paint it, it has AREA," said Robert.

This shape is made up of 2 rows of 5 squares.



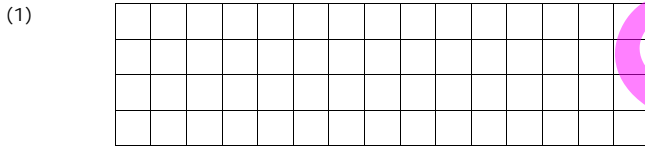
What is the area?

If the shape was made up of 8 rows of 5 squares, what would the area be?

Answers: 10 square units, $8 \times 5 = 40$ square units



Work out the area of these rectangles by first counting the number of squares in ONE row.



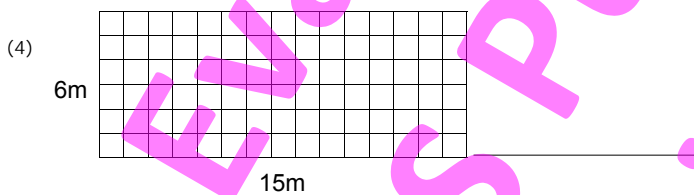
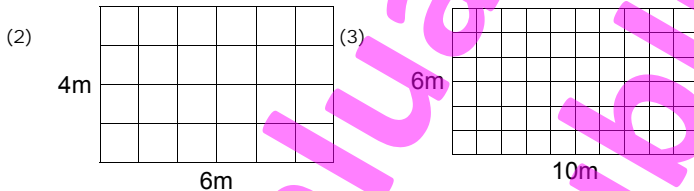
1 row = _____ squares

Area = ____ rows of _____ = _____ sq units

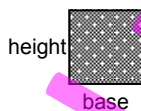
The diagrams below are not drawn to scale, but imagine that each square is 1 square metre.

The units for your answers will be 'square m'.
(Could be written as 'sq m' or m^2)

Work out the area of each rectangle or square.

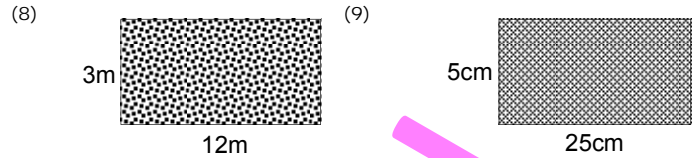
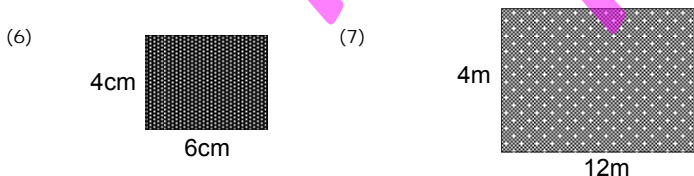


(5) How can you work out the area of these shapes without having to count all squares?



Work out the area of each rectangle or square.

Area of a rectangle or square = base x height



(10) What is the area of a rectangle with sides of 9 centimetres and 12 centimetres?

(11) What is the area of a paddock that is of 100m long and 45m wide?

(12) What is the area of a square which has sides of 9 metres?

(13) If a square has an area of $64cm^2$, how long is each side of the square?

(14) If a square courtyard has an area of $144m^2$, how long is each side of the courtyard?

A fence that is 60m long and 1.8m high is to be spray painted with two coats of paint on one side only.



(15) **Work out** the surface area of the fence. Give your answer in m^2 .

(16) **Work out** the total area that has to be painted. Give your answer in m^2 .

(17) If 1 litre of paint covers $15m^2$ of the fence, how many litres of paint will be needed?



(18) If the paint costs \$84.95 for a 4L can, how many cans will you need and how much will it cost?

The aim of this activity sheet is to revise the concept of area. For squares or rectangles, area is the length of the base multiplied by the length of the height ($A = bh$)



Suggested extension activity:

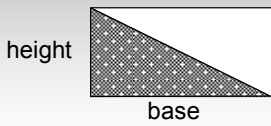
Find square or rectangular shaped objects around the house that can be measured. Ask your child to measure the 'base' and 'height' (or 'width') of these objects and work out their areas.

Example: A door is 0.7m by 2.0m. Area = $0.7 \times 2 = 1.4m^2$.

Make up some problems as on this worksheet, that involve area in practical situations, such ... finding the area of the living room that requires new carpet etc.

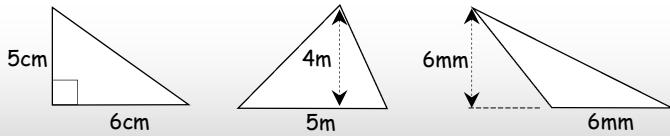
Sign when completed:

This rectangle has been cut in half. The area of a triangle created will be half that of the rectangle.



Area of a triangle = $\frac{1}{2}bh$

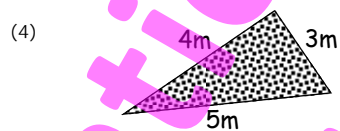
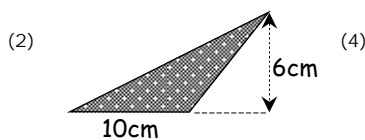
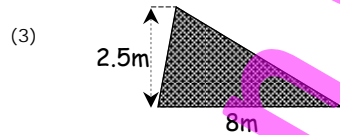
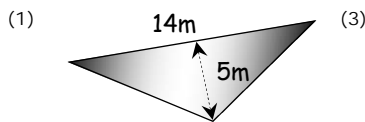
Example: Find the area of these triangles.



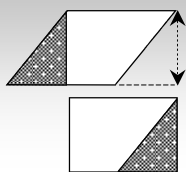
Answers: $A = \frac{1}{2} \times 6 \times 5 = 15\text{cm}^2$ $A = \frac{1}{2} \times 5 \times 4 = 10\text{m}^2$ $A = \frac{1}{2} \times 6 \times 6 = 18\text{mm}^2$

Note: The base and height always intersect at right angles.

Work out the area of each triangle.



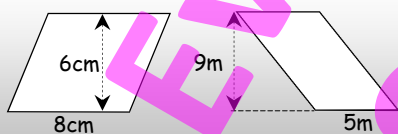
A parallelogram has two pairs of parallel sides.



If a triangular shape is cut off one end and moved to the other end, it forms a square or rectangle.

Area of a parallelogram = bh

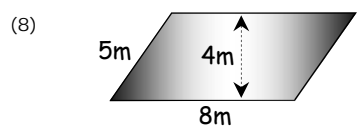
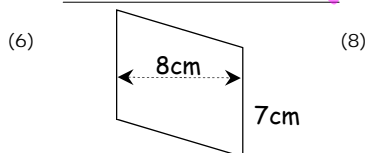
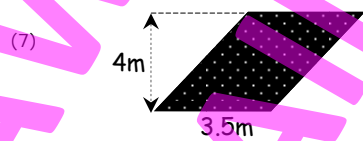
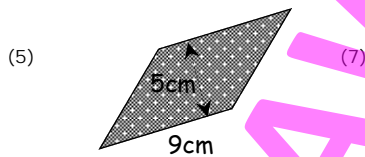
Example: Find the area of these parallelograms.



Answers:
 $A = 8 \times 6 = 48\text{cm}^2$
 $A = 5 \times 9 = 45\text{m}^2$

Note: The base and height always intersect at right angles.

Work out the area of each parallelogram.



Work out the length of the missing side, given the area and one side.



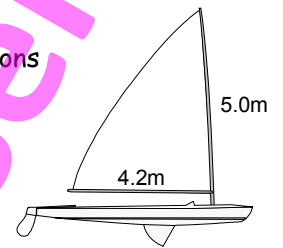
(9) If the area of a triangle is 48cm^2 and the base is 8cm, what is the height of the triangle?

(10) If the area of a parallelogram is 72cm^2 and the base is 9cm, what is the height?

(11) If the area of a triangle is 108cm^2 and the height is 12cm, what is the base of the triangle?

(12) If the area of a parallelogram is 240m^2 and the base is 20m, what is the height?

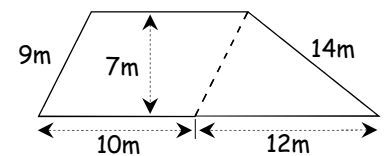
This diagram shows the dimensions of a triangular sail for a yacht.



(13) Work out the area of this sail.

(14) If sail cloth cost \$250 per square metre, how much would it cost to replace this sail?

This diagram shows the shape of a new courtyard.



(15) Work out the area of this compound shape. Note: Not ALL measurements are needed, so use only the side lengths you need.

The aim of this activity sheet is to work out the area of triangles and parallelograms, given what is known about the area of squares / rectangles.

Suggested extension activity:

Find objects around the house that are shaped like triangles and parallelograms or create these shapes using card. Ask your child to measure the length of the base and the height for each object and work out their areas.

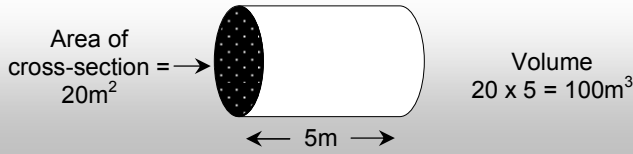
Example: What is the area of this triangular shaped kite?

Sign when completed: _____

If you can fill it, it has VOLUME.

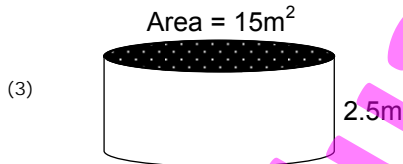
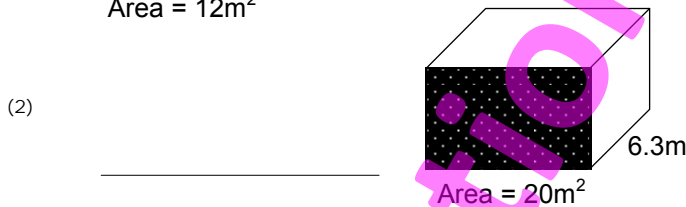
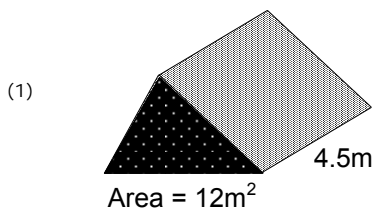
If you know the area of the **cross-section** of a 3D object, the volume can be calculated using the rule ...

Volume = Area of cross-section × depth



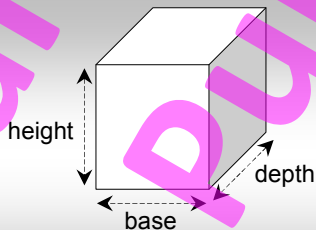
Work out the volume of these objects, given the area of the cross section (shaded) and the depth.

The volume units are written as ... mm^3 , cm^3 and m^3 .



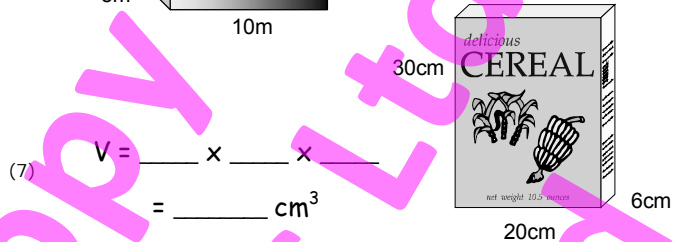
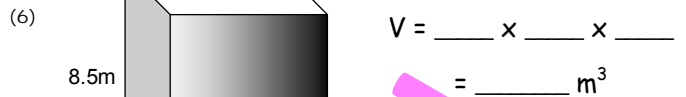
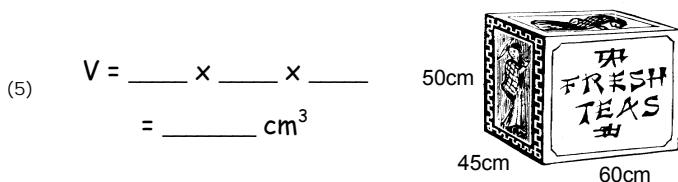
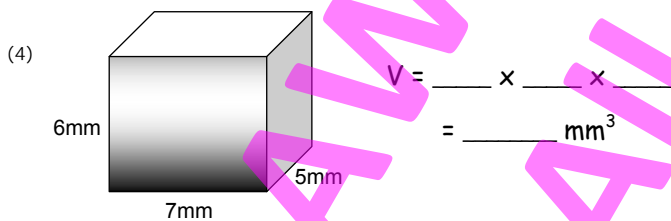
For this 3D shape, the volume can be worked out if we know three measurements ...

the **base**, the **height** and the **depth**.



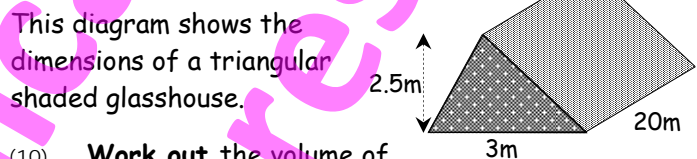
Volume = base × height × depth

Work out the volume of these simple 3D shapes.

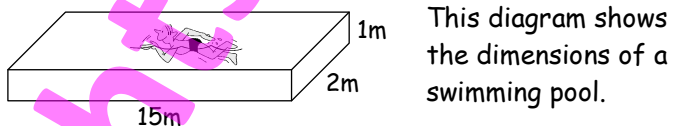


(8) The volume of a cube is 48cm^3 , with a base of 4cm and a depth of 6cm. What is the height of the cube?

(9) A new concrete path is 60m long, 1.2m wide and 0.2m deep. **Work out** the volume of concrete in this path.



(10) **Work out** the volume of air within this glasshouse.



(11) The pool is filled with water to a height 10cm below the top. **Work out** the volume of water in this swimming pool.

(12) The pump is used to empty the pool, can pump water at a rate of 9m^3 per hour. How long would it take to empty the pool?



The aim of this activity sheet is to revise the concept of volume. The volume of a simple box shape can be worked out if you know the base, height and depth.

Suggested extension activity:

Find a selection of boxes around your home. Ask your child to measure the base, height and depth of each box. Use these measurements to work out the volume of each box.

Example: A shoe box, a match box, a cake tin etc.

Sign when completed: _____

Being able to tell the time is an important skill.

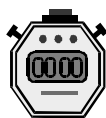
Example: Is 10 to 5 the same as 4:50?

Is 3:15 p.m. the same as 1515?

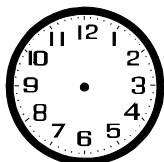


04:50

Below the time is written as words. Draw how each time would appear on an analogue clock face and write as a.m. / p.m. and 24hr digital time.



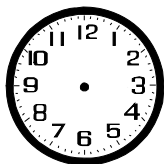
(1) quarter past 9 in the morning



a.m. or p.m. → _____

24hr digital time → :

(2) 20 to 2 in the afternoon



a.m. or p.m. → _____

24hr digital time → :

The table shows information about some flights between Christchurch and Wellington.



Christchurch to Wellington				
Day	Depart	Arrive	Flight	Plane
Mon	0845	0930	CW01	BE30
Mon	1055	1140	CW04	BE30
Mon	1525	1620	CW06	BE32
Mon	1815	1910	CW10	BE32

- (3) When does flight CW06 depart Christchurch? _____
- (4) When does flight CW01 arrive in Wellington? _____
- (5) How many different planes fly this route? _____
- (6) What is the flight time for the faster plane? _____
- (7) A BE32 plane lands in Wellington at 13:15 p.m. At what time did it depart from Christchurch. _____
(Give your answer as 24hr time.)
- (8) Flight CW04 leaves Christchurch at 1055. It returns to Christchurch, after stopping in Wellington for 40 minutes. At what time does it land back in Christchurch? _____
(Give your answer as a.m. or p.m. time.)

Maps or plans are often drawn to **scale**. That means you can use the scale to work out actual distances.

Example: For this scale ...

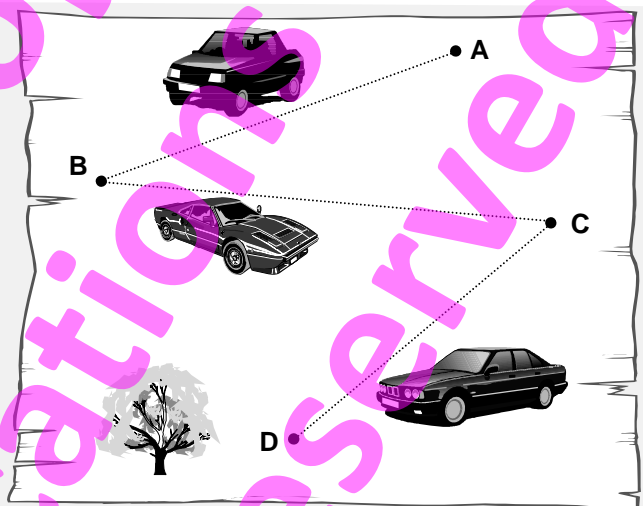


... 1cm on the map = 1km actual distance.

This map has been drawn using the scale below ...



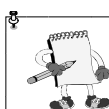
(9) On this scale above, 1cm = _____ km.



The letters of this map represent towns. Measure to the nearest centimetre the distance between towns.

Convert your measurements to actual distances using the scale above the map.

- (10) Town A and Town B: Measurement: _____ cm
Actual distance: _____ km
- (11) Town B and Town C: Measurement: _____ cm
Actual distance: _____ km
- (12) Town C and Town D: Measurement: _____ cm
Actual distance: _____ km
- (13) On the map, draw a line between Town A and Town D. Along this line mark a point (Town E), which is 7.5km from Town D.



The aim of this activity sheet is to work with time in its various forms, understand and use a timetable and use a scale to work out actual distances.

Suggested extension activity:



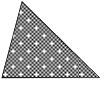







Using both analogue time and digital time, ask your child to convert between a.m. / p.m. time and 24hr time.

Find a bus or plane timetable and ask your child similar questions as on this worksheet.

Find a city street map and using the scale on the map, ask your child to work out the distances between various points or the length of certain streets.

Sign when completed: _____

Name these 2D shapes.





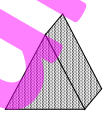
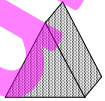

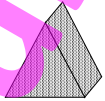
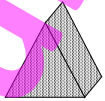
- (1)  → _____
- (2) _____ ← 
- (3)  → _____
- (4) _____ ← 
- (5)  → _____
- (6) _____ ← 
- (7)  → _____
- (8) _____ ← 
- (9)  → _____
- (10) _____ ← 

The 3D objects are based on many of the 2D shapes.

Example: A cylinder is based on a circle. If you stacked some 50c coins on top of each other, it would look like a cylinder.



Name these 3D shapes.

- (11)  → _____ ← 
- (12) _____ → _____ ← 
- (13)  → _____ ← 
- (14) _____ → _____ ← 
- (15)  → _____ ← 
- (16) _____ → _____ ← 

This block of cheese has been sliced as shown. What shape would the sliced end look like?

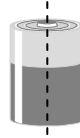


If you cut through an object, you see a cross-section of the object.

Look at these objects and describe what 2D shape you would see if they were sliced along the dotted line.

- (17)  _____
- (18) _____ ← 

(19)

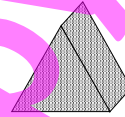


(20)

Draw a line on this 3D shape so that when it is cut, the cross-sectional 2D shape created would be an oval.



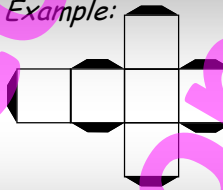
(21)



Draw a line on this 3D shape so that when it is cut, the cross-sectional 2D shape created would be a triangle.

A cardboard box has been unfolded and laid out flat.

Example:



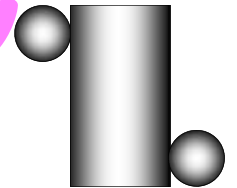
The diagram of the unfolded cube is called a net. The small black strips on the sides are the flaps needed to hold the cube together.

If this net was refolded back into the box, what 3D object would it form? Answer: A cube.

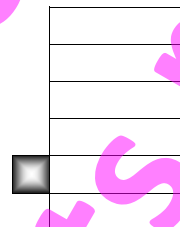
(22)

Look at this net.

What 3D object does it create when it is folded?



(23)



Look at this net.

What 3D object does it create when it is folded?

Use mathematical instruments to accurately draw this net on cardboard.



(24)

Cut out this net and fold to make the 3D object and name the 3D object you have created.

The aim of this activity sheet is to revise the names and features of simple 2D and 3D shapes and recognise what 2D shapes make up a net of a 3D object.

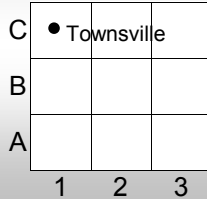
Suggested extension activity:

Select one of the 2D or 3D shapes on this activity sheet. Describe the shape by its features and ask your child to draw and name the shape.

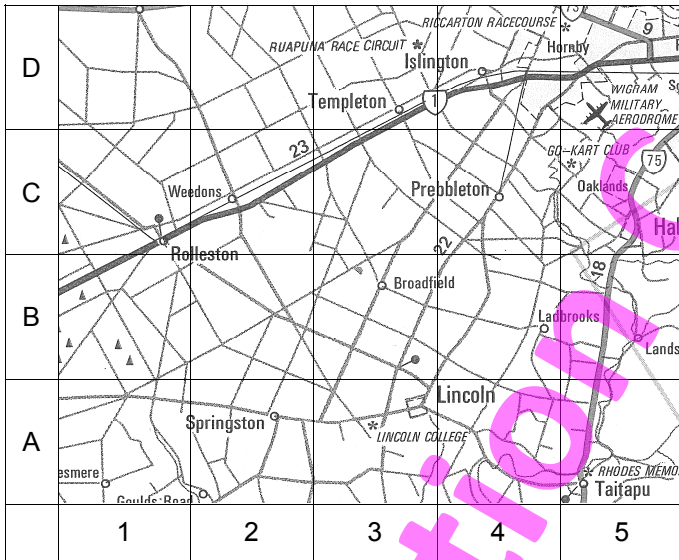
Example: I have four corners, all my four sides are the same length. (Answer: It could be a square or a rhombus)

Sign when completed: _____

Maps are divided up into 'squares' or grids. Letters and numbers on the sides of a map are called **grid references** and refer to an area of the map, rather than a specific point. Places can be found by using these letters and numbers.

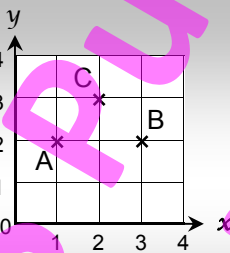


Example: Townsville is in the grid 1C.



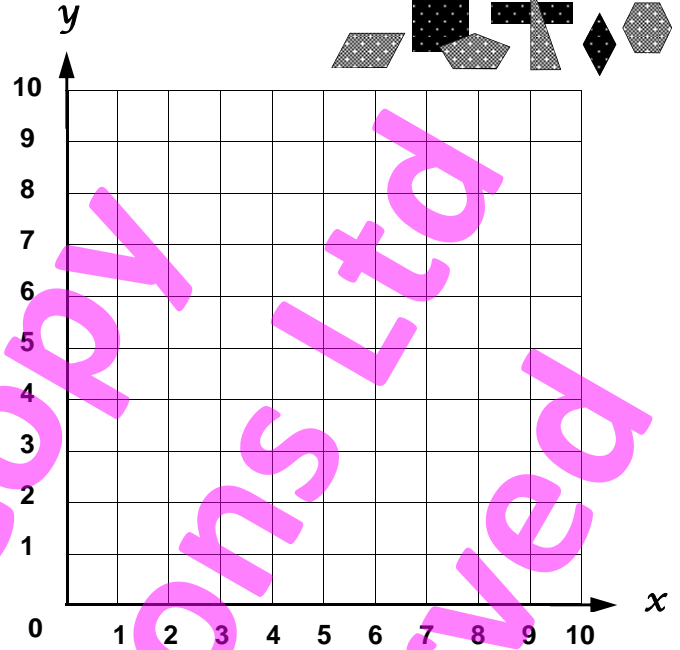
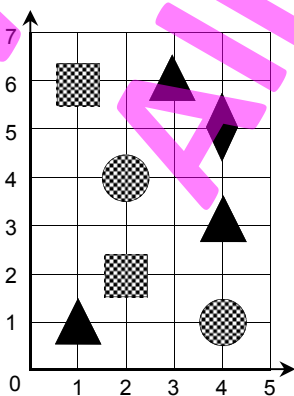
- (1) What towns are in the grid references?
 2C = _____, 5A = _____
 4D = _____, 4C = _____
- (2) Name the grid references for Lincoln College (_____) and the Ruapuna race circuit (_____).

To locate an exact point on a graph, **co-ordinates** are used.
 Example: A = (1,2) B = (3,2)
 Each pair of numbers in the brackets are called **ordered-pairs** or **co-ordinates**.
 The first number (x-axis) is across and the second number (y-axis) is up / down.
 What are the co-ordinates of C? Answer: C = (2,3)



- (3) What shape is at the point (4,5)?

- (4) Write the co-ordinates to locate all the shapes.
 squares _____
 circles _____
 triangles _____



Plot each set of points on the graph, joining the points in order with straight lines.

- (5) (3,4), (1,4), (1,2), (3,2) and (3,4)
 What shape have you drawn?

- (6) (0,5), (1,8), (3,8), (2,5) and (0,5)
 What shape have you drawn?

- (7) (7,7), (7,9), (4,9), (4,7) and (7,7)
 What shape have you drawn?

- (8) (8,7), (9,9), (10,7), (9,5) and (8,7)
 What shape have you drawn?

- (9) (7,1), (8,1), (9,2), (9,3), (8,4), (7,4), (6,3), (6,2) and (7,1). What shape have you drawn?

The aim of this activity sheet is to learn how to locate places on a map using grid references and use the co-ordinate system for locating specific points on a graph.
 Note: Order is important (x,y) or (across, up/down).

Suggested extension activity:
 Using a city street map or country map, ask your child to locate various places using a grid reference or play a game of battleships.
 Using maths paper, create a graph on which points can be drawn. Having marked points on the graph, ask your child to locate each point, describing each position as an ordered pair or co-ordinates.
 Create some ordered pairs and ask your child to plot each point on a new graph, such as above.
 Sign when completed: _____

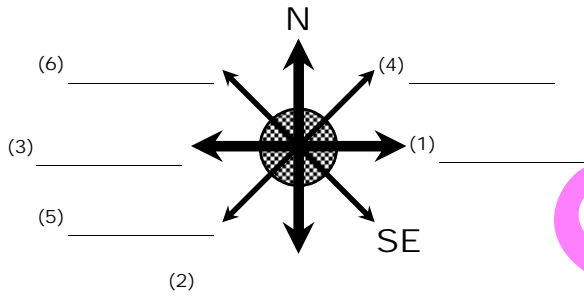
When you do not have a road to follow, using a compass can help you find your way around.



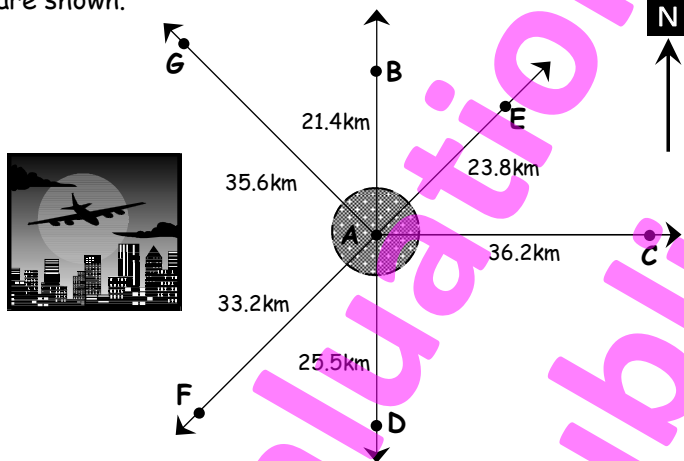
Example: Jack flew his plane 4km south, then headed southwest for 6km.

Using letters to represent the points of the compass, write in the missing compass points.

Example: southeast = SE



On this diagram below each letter represents a town, the distances between Town A and all other towns are shown.



- (7) Which town is north of Town A? _____
- (8) Which town is 23.8km from Town A? _____

Write the compass directions and distances required to travel from Town A to all other towns.

- (9) Town A to Town B _____
- (10) Town A to Town C _____
- (11) Town A to Town D _____
- (12) Town A to Town E _____
- (13) Town A to Town F _____
- (14) Town A to Town G _____
- (15) Town H is 25km SE of Town A. Using the scale below, draw on the map the position of Town H.

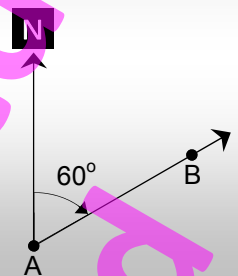


A direction can be given as a bearing. Measured in a clockwise direction from North, the bearing is the angle between north and the direction.

Example: East has a bearing of 90° .
West has a bearing of 270° .

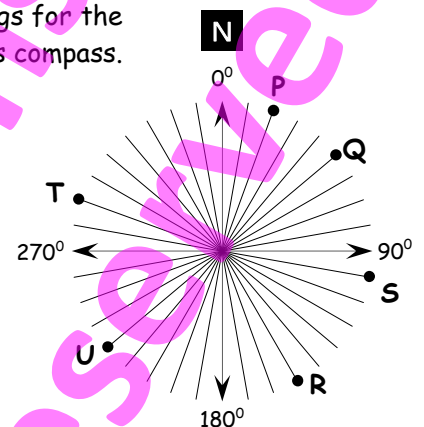
In this diagram, the angle in the clockwise direction between NORTH and line AB is 60° .

That means point B is at a bearing of 60° from point A.



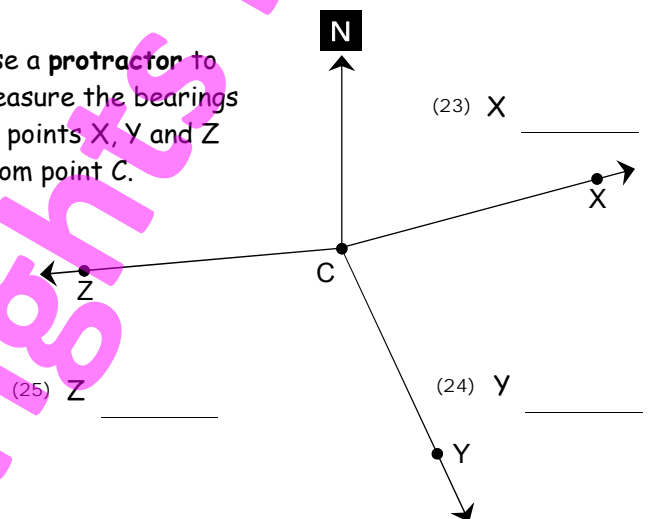
Work out the bearings for the points marked on this compass.

- (16) P _____
- (17) Q _____
- (18) R _____
- (19) S _____
- (20) T _____
- (21) U _____
- (22) Point V is at a bearing of 320° .



Mark point V on the compass above.

Use a protractor to measure the bearings of points X, Y and Z from point C.



The aim of this activity sheet is to use the compass points and compass bearings to describe or locate points.

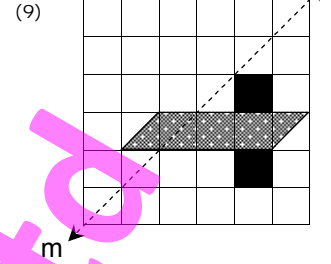
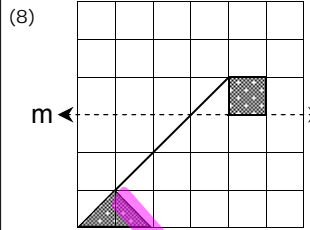
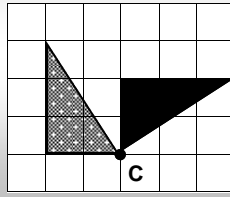
Suggested extension activity:
Use a street map, a map of New Zealand or create your own map. Locate NORTH on the map and ask your child to locate various places on the map. Describe the location of these places using words or bearings and work out the distance using the scale on the map.
Example: Cave is 102km northeast of Mt Hutt or if you travel from Mt Hutt on a bearing of 45° for 102km, you will arrive at Cave.

Sign when completed: _____

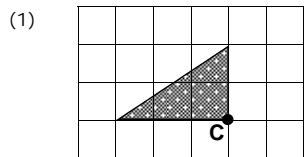
To rotate a shape or an object, you need an **angle of rotation** and a **centre of rotation**.

Example: The shaded triangle (object) has been rotated $\frac{1}{4}$ turn (90°) clockwise about point C.

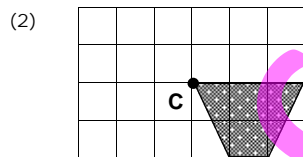
The new position of the triangle is the black shape, called the image.



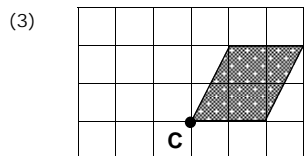
Draw the new position of each shape after it has been rotated as directed.



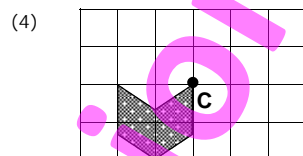
Rotate this shape a quarter turn (90°) clockwise about point C.



Rotate this shape a half turn (180°) anti-clockwise about point C.



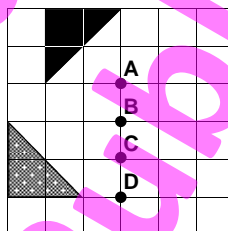
Rotate this shape a quarter turn (90°) anti-clockwise about point C.



Rotate this shape a half turn (180°) clockwise about point C.

(5) The grey shape (object) has been rotated to a new position and is shaded black (image).

Describe this rotation and name the centre of rotation.



Below are examples of shapes and diagrams that have lines of symmetry ...

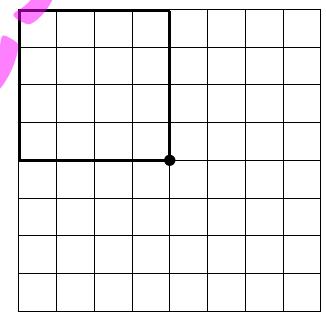


... but not all shapes have lines of symmetry.

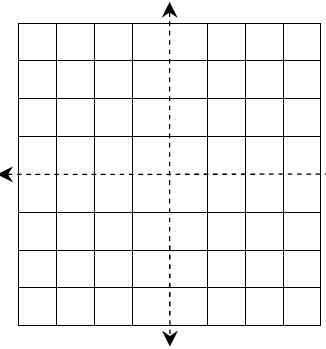
Draw in the lines of symmetry for these shapes.



(14) Draw a design in the top 4 x 4 square of this grid. Rotate and redraw your design into the three other squares so that the point in the middle is the centre of your design.



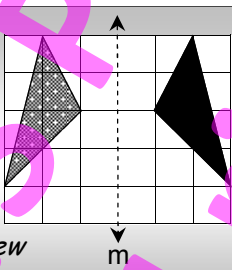
(15) Draw a design in the top 4 x 4 square of this grid. Reflect and redraw your design into the three other squares so that the arrows are the lines of symmetry.



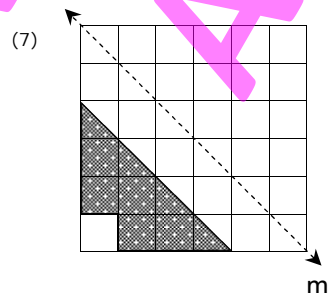
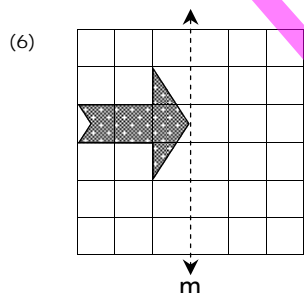
For a shape to be reflected, there must be a **mirror line (m)**.

The mirror line (line of symmetry) is often shown as an arrow.

Example: The shaded triangle (object) has been reflected to its new position, the black triangle, called its image.



Draw the new position of each shape after it has been reflected in the mirror line.



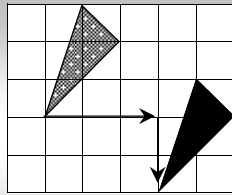
The aim of this activity sheet is to revise rotation and reflection. Rotations can be described using various words and reflections require lines of symmetry.

Suggested extension activity:
Looking around your home, ask your child to point out designs that have been created by either rotating a pattern or reflecting a pattern.
Example: Wallpaper or floor tile patterns.
Ask your child to create their own designs using rotation or reflection and have them describe how they created their design.

Sign when completed: _____

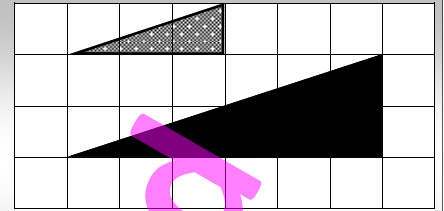
This grey triangle (object) has been moved by sliding it to a new position (image).

Example: 3 squares right, then 2 squares down.



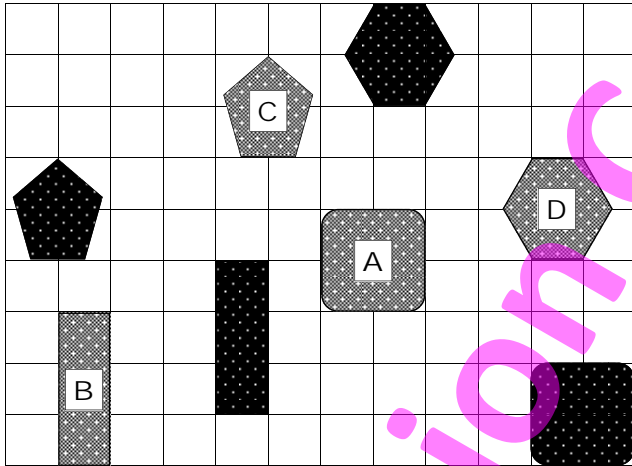
Such a movement is called a **translation**.

Sam used maths paper to draw this small grey triangle (object) twice as big (black image).



Each side of the triangle is twice as long and has been enlarged by a **scale factor** of 2.

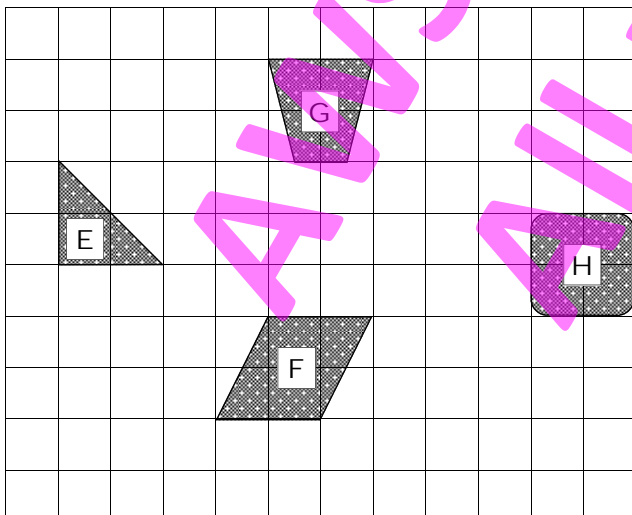
Describe how each grey shape (object) has been translated to its new position (black image).



- (1) A _____
- (2) B _____
- (3) C _____
- (4) D _____

(5) Draw the new position of each shape after it has been translated.

- Shape E - 1 square right, 3 squares up
- Shape F - 3 squares left, 2 squares down
- Shape G - 2 squares right, 6 squares down
- Shape H - 2 squares left, 3 squares up

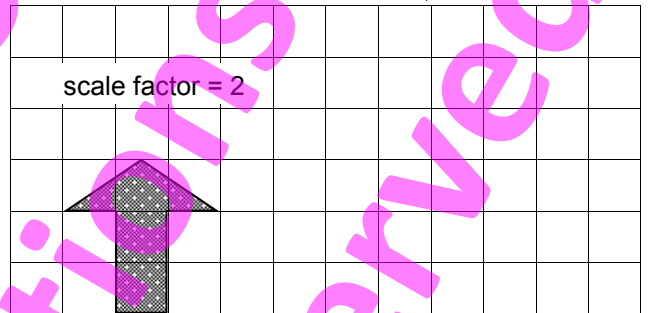


Draw each shape after it has been enlarged by the scale factor given.



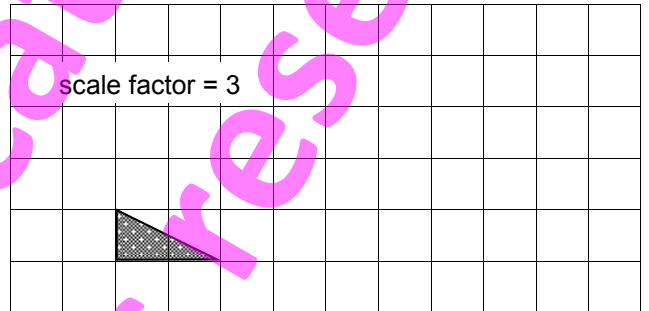
(6)

scale factor = 2



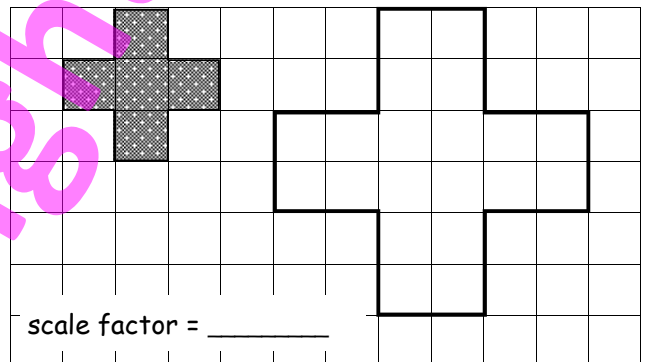
(7)

scale factor = 3



Look at the enlargement below and work out the scale factor. The grey shape is the object.

(8)



The aim of this activity sheet is to revise translation and enlargement. Translation involves sliding the same object to a new position. For enlargement, the shape changes size but does not slide, flip or rotate.

Suggested extension activity:

Looking around your home, ask your child to point out groups of objects that demonstrate translation or enlargement.

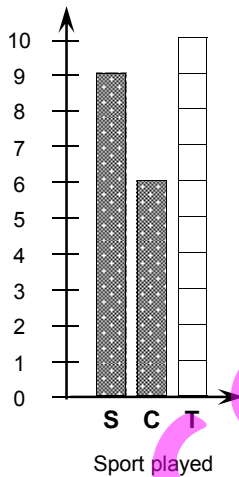
Example: A picket fence, strips of wallpaper, a line of bottles in a row.

Draw various patterns that involve sliding or translation and using maths paper, draw designs involving enlargement.

Sign when completed: _____

Data can be displayed in many ways.

In Room 10 there are 23 pupils. This **column graph** shows the number of pupils in Room 10 who play softball (S) and cricket (C).



- (1) How many pupils play each sport? Number of players



softball (S) = _____

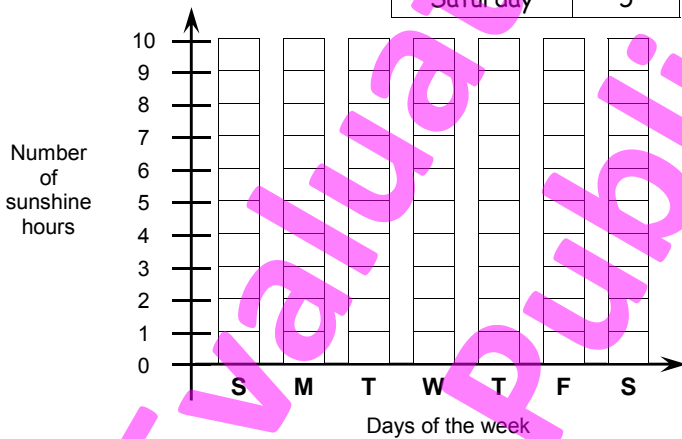
cricket (C) = _____

- (2) **Complete** the graph by shading in the number of pupils who play tennis.

This table shows the number of sunshine hours per day for a week.

	Total
Sunday	6
Monday	9
Tuesday	8
Wednesday	10
Thursday	4
Friday	7
Saturday	5

- (3) **Complete** this **column graph** using the data in the table.



- (4) How many hours of sunshine were there on Wednesday? _____
- (5) On which day was it sunny for 8hrs? _____
- (6) How many hours of sunshine occurred this week? _____

Pupils in Room 8 have 20 pet cats and dogs.

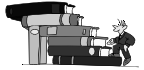


This **pictogram** shows the number of pet cats Room 8 pupils have.

Key: 1 picture = 2 pets

- (7) How many pet cats do they have? _____
- (8) How many pet dogs do they have? _____
- (9) **Complete** the **pictogram** above by drawing 'dogs' to show how many pupils have pet dogs.

This table shows the number of vowels used in the first 60 words of a novel.



	a	e	i	o	u
Total	48	36	40	32	22

- (10) **Draw a pictogram** using the data in the table.

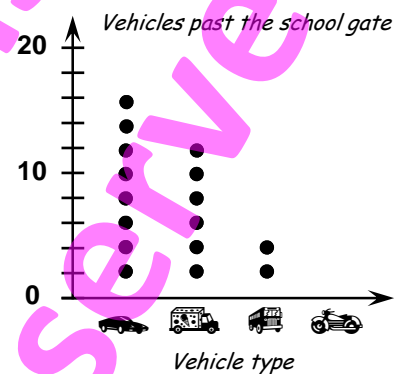
a:
e:
i:
o:
u:

Key: 1 picture = 8 vowels



The number of cars, trucks, buses and bikes going past the school in 15 minutes was 40.

This **dot plot** graph shows the number of cars, trucks and buses.



- (11) How many cars, trucks and buses went past the school gate?

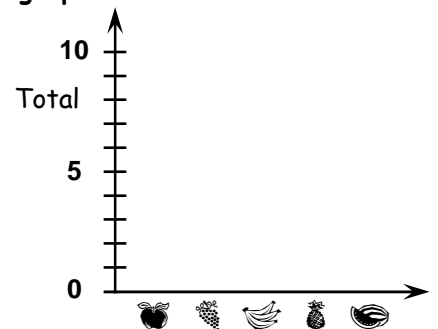
car = _____, truck = _____, bus = _____

- (12) How many bikes went past the gate? _____

- (13) **Complete** the **dot plot** above to show how many bikes went past the school gate.

- (14) **Draw a dot plot graph** for the data in the table below.

Fruit	Total
	7
	8
	10
	5
	9



The aim of this activity sheet is to create three different data displays - a column graph, a pictogram and a dot plot graph, then answer questions appropriate to the data.

Suggested extension activity:

Using data collected from around your home, ask your child to create some column graphs, dot plots or pictograms. For pictograms involving large groups of data, each picture can be worth more than one.

Example: If there were 30 items, by making each picture worth 5, only 6 pictures would be drawn.

Sign when completed: _____

A stem and leaf graph looks a bit like a leaf.
 Example: Robert weighed 12 tomatoes, to the nearest gram.

39, 41, 48, 52, 38, 37, 45, 43, 51, 44, 46, 36

As these numbers are in the 30's, 40's and 50's, the numbers 3, 4 and 5 go in the 'stem' part of the graph.



3	9, 8, 7, 6	← The second numbers form the 'leaf' part of the graph and are added to the graph in the order listed.
4	1, 8, 5, 3, 4, 6	
5	2, 1	

Mark used this stem & leaf graph to record the number of runs the other 10 players in his cricket team scored in a match.

0	9
1	7, 9
2	4, 8
3	3, 7, 4
4	8
5	3



(1) How many runs did each player score, as shown in this stem and leaf graph?

(2) What was the highest score? _____

(3) What was the lowest score? _____

(4) If the team scored 348 runs, how many runs did Mark score? Add his score to the stem & leaf graph above.

(5) Draw a stem and leaf graph for the numbers in each box.

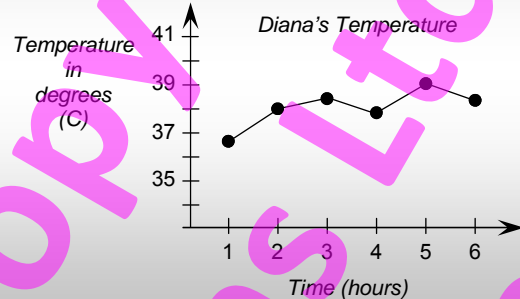
78, 84,
61, 75,
92, 77,
89, 68,
80, 72,
94, 65



213, 229,
227, 201,
235, 216,
219, 235,
200, 224,
210, 237

Data that changes with time can be graphed on a time-series graph.

Example: Diana has been unwell. She recorded her temperature every hour for 6 hours. These results are shown on the graph.



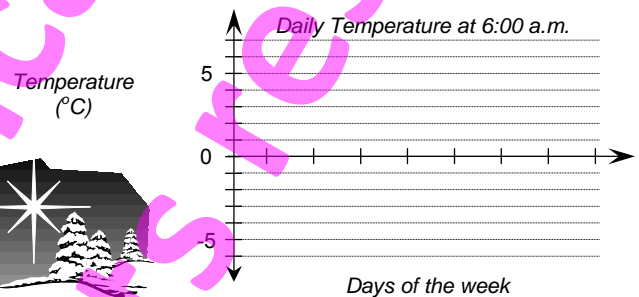
What was Diana's highest temperature? (39°C)

Starting on Monday, each day for a week the air temperature (°C) at the airport at 6:00 a.m. was recorded. These were the results.

5°C	-2°C	0°C	-3°C	6°C	3°C	-1°C
-----	------	-----	------	-----	-----	------



(6) Complete the time series graph by plotting the data in the table, joining each point with a straight line.



(7) What were the temperatures on Tuesday and Friday? _____

(8) What was the difference in temperature between the coldest and warmest morning?

(9) On the following Monday it was 3 degrees colder than it was on Wednesday. Draw this new temperature on the time-series graph above.



The aim of this activity sheet is to create two different data displays - a stem & leaf graph and time series graph, then answer questions appropriate to the data.

Suggested extension activity:

Collect or make up data that can be presented as a stem & leaf graph. This is normally a list of data numbers that have been collected by counting or measuring something. Create some stem & leaf graphs. Collect or make up data that can be presented as a time series data. Time series data changes over time, such a temperature, heights of plants or the weight of a pet etc. Create some time series graphs.

Sign when completed: _____

Data obtained by **counting** is called **discrete data**.

When there is a large range of data scores, the data can be organised into groups (class intervals) using a **frequency table**.

Example: The results of a class test are shown in this frequency table.

Test scores	Tally	Frequency
0 - 4		1
5 - 9		5
10 - 14		6
15 - 19		8
20 - 24		3
25 - 30		5
		28

How many pupils scored between 15 and 19?

How many scored exactly 30?

Answers: 8 pupils, impossible to work out (5 pupils scored above 25)

In a science experiment, the number of bugs on each plant were counted and recorded in the box below.

12, 9, 6, 14, 18, 2, 7,
10, 17, 14, 13, 6, 3, 19,
17, 18, 12, 9, 11, 15,
19, 14, 8, 2, 4, 12, 17,
14, 5, 19, 17, 14, 8, 11,
4, 14, 12, 17, 14, 8

Bug numbers	Tally	F
0 - 3		
4 - 6		
7 - 9		
10 - 12		
13 - 15		
16 - 19		

- Organise this data using the frequency table.
- What was the most common group? _____
- What was the less common group? _____

Other data is obtained by **measuring** and can take on any value. This type of data is called **continuous data** and can also be organized using a **frequency table**.

Example: The height of pupils in Rm 8 are shown in this frequency table.

Height	Tally	Frequency
1.1m -		3
1.2m -		4
1.3m -		9
1.4m -		8
1.5 - 1.6m		7
		31

How many pupils are shorter than 1.3m?

Answers: 7 pupils (3 + 4)

In an apple packing plant, apples are graded by their weight. Below are the weights in grams of some apples.

70.8, 85.3, 71.6, 72.4, 80.7,
84.9, 79.4, 83.7, 85.9, 76.1,
84.5, 92.7, 77.8, 80.3, 79.8,
85.2, 73.4, 84.9, 86.7, 89.7,
81.8, 87.1, 78.4, 73.5, 85.3,
78.1, 90.9, 83.2, 81.9, 72.3,
76.5, 81.3, 89.3, 92.1, 74.9

Weight (gms)	Tally	F
70.0 -		
75.0 -		
80.0 -		
85.0 -		
90+		

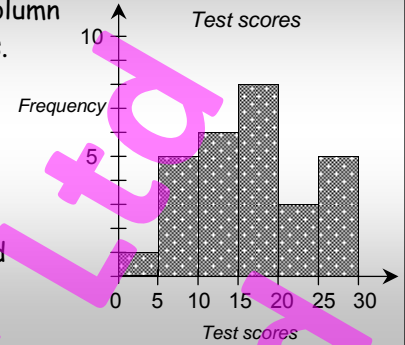
- Organise this data using the frequency table.
- What is the heaviest apple that could be in the 75.0 - group? _____
- Only apples weighing over 80.0 but under 90.0 grams are for export. How many of these apples will be exported? _____



Grouped discrete data and continuous data can be displayed in a **histogram**.

A histogram is like a column graph without the gaps.

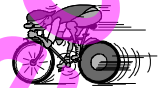
Example: Grouped discrete data for a class test is shown in this histogram.



How many pupils scored between 20 and 24?

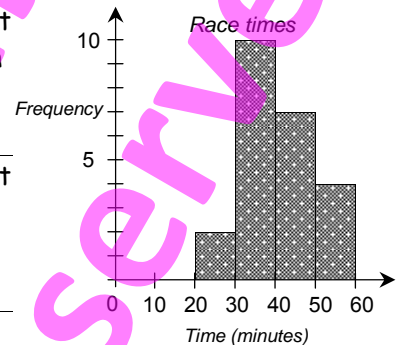
Answers: 3 pupils

The **histogram** below shows the results of a cycle race.



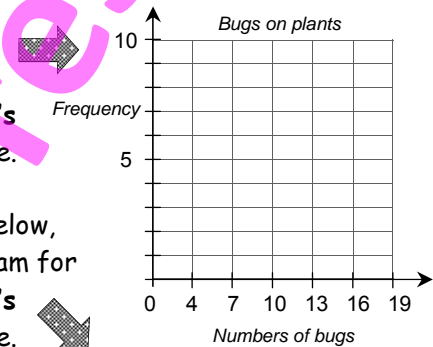
(7) How many cyclist took longer than 50 minutes?

(8) How many cyclist took less than 40 minutes?



(9) Complete this histogram for the data in Q1's frequency table.

(10) In the space below, draw a histogram for the data in Q4's frequency table.



The aim of this activity sheet is to learn the difference between grouped discrete and continuous data, use a frequency table and draw a histogram.

Suggested extension activity:

Ask your child to collect discrete data that can be grouped or continuous data that involves measuring. Sort the data into groups (class intervals) using a frequency table and then draw a histogram.

Example: Weigh 20 potatoes or onions using kitchen scales. Make up 4 or 5 groups and sort the weights into each group, then draw the graph.

Sign when completed: _____

A **pie graph** is a circle that has been divided into sectors, like cutting up a round pie. Each sector represents a fraction or percentage of the total.



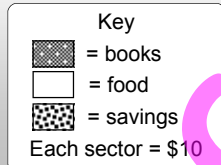
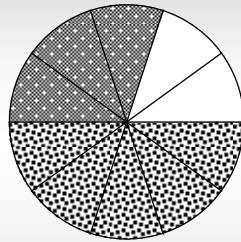
Example: This pie graph shows what he did with his money.

How much money did James save?

What percentage of the graph is savings?

If he saved \$70.00, how many sectors would need to be shaded in?

Answers: \$50.00, 50%, 7 sectors



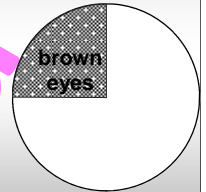
A **pie graph** can also be drawn using a **protractor**.

Example: If a quarter of Room 8 pupils have brown eyes, draw the pie graph sector to show this.

Draw a circle with a compass and mark in a radius. There are 360° in a circle. The **sector size** would be ... $\frac{1}{4} \times 360^\circ = 90^\circ$

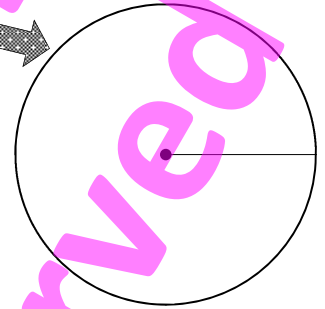
Draw the sector with a protractor, using the radius as one side of the sector.

Other sectors can be drawn if you have the data.



(9) Draw a pie graph with the **sector angles** of 45° , 70° , 105° and 140° .

(10) In a pie graph a sector angle was 120° . What fraction of the graph does that represent?

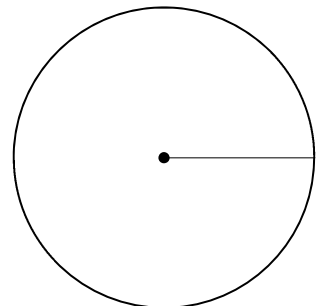
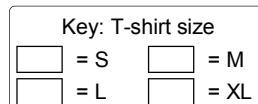


(11) In a pie graph a sector angle was 144° . What percentage of the graph does that represent? _____

(12) A local shop sold 120 t-shirts. The table below shows the number of each size sold. **Work out** the sector angles required to draw a pie graph. The first calculation is done for you.

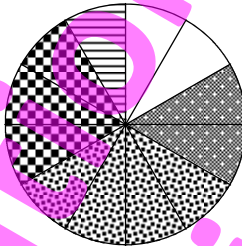
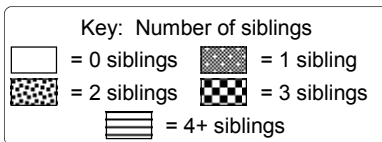
T-shirt size	F	Sector angle size calculation
S	30	$\frac{30}{120} = \frac{1}{4}$, sector angle size = $\frac{1}{4} \times 360^\circ = 90^\circ$
M	60	
L	20	
XL	10	
	120	

(13) Draw the pie graph using the **sector angles** worked out above and **create a key** below.



The 36 pupils in Room 4 were asked how many siblings (brothers and sisters) they each have.

The results are shown in this pie graph.

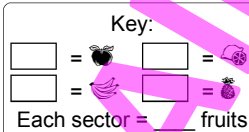


- How many sectors in the pie graph? _____
- How many pupils does each sector of the pie graph represent? _____
- How many pupils have no siblings? _____
- What fraction of the class have no siblings? _____
- How many pupils have 3 siblings? _____
- What percentage of the pupils have 3 siblings? _____
- $\frac{1}{12}$ of the pupils had how many siblings? _____

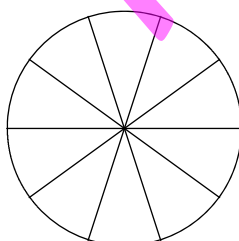
Below are diagrams of different fruits.



(8) **Organise** this data using the frequency table below, **create** a key and **shade** in the pie graph sectors.



Shape	Tally	F



The aim of this activity sheet is to create and understand pie graphs. Firstly, pie graphs divided into sectors and then pie graphs created using a protractor.

Suggested extension activity:

Collect or make up data that can be presented as a pie graph. Create simple pie graphs as used in questions 1 to 8.

Example: How you spend the hours of 1 day. 8hrs sleeping, 6hrs school, 2hrs watching TV, 3hrs playing outside with friends etc.

For a greater challenge, create pie graphs by calculating pie sectors and using a protractor to draw the pie graph.

Sign when completed: _____

There are three commonly used types of averages called the **mean**, **median** and **mode**.

The **mean** is worked out by



Adding up all the scores, then divide the answer by the number of scores.

Example: Find the mean of 5, 9, 14 & 20.

Answer: $5 + 9 + 14 + 20 = 48$, $48 \div 4 = 12$, mean = 12

Work out the mean of each group of scores and **round your answers to 1 decimal place** (1 d.p.)



(1) 13, 16, 23, 29 _____

(2) 35, 56, 69 _____

(3) 13, 39, 52, 87 _____

(4) 15, 22, 38, 19, 41, 29 _____

Jack likes to go for bike rides in the weekend. The distances of his bike rides were 23, 31, 47, 52, 33 and 39 kilometres.



(5) What is the **mean** distance of Jack's bike rides?

The **median** is worked out by ...

Write the scores in order from smallest to largest. The median is the middle score.

Example: 3, 4, 6, 7, 8, 9, 13, 21, 35.

As these scores are in order, start counting one score off each end until you reach the middle.

The **median** (middle) score for this list is 8.

If there is an even number of scores, there will be two scores left in the middle.

The **median** is half way between these scores.

Example: 5, 6, 9, 13 (6 & 9 are in the middle)
Median = $7\frac{1}{2}$ ($6 + 9 = 15$, $15 \div 2 = 7\frac{1}{2}$)



Work out the median for each list of scores

(6) 15, 18, 25, 28, 33 _____

(7) 28, 30, 43, 48, 49, 57, 63 _____

(8) 11, 19, 25, 27, 38, 43 _____

(9) 21, 14, 18, 26, 32, 29 _____

In one week the pupils in Room 7 each read some books, as shown below.

5, 2, 4, 3, 4, 5, 2, 3, 4, 3, 5, 3, 4



(10) **Work out the median** number of books read?

The **mode** is the easiest 'average' to work out.

The mode is the most common score

Example: What is the mode of these scores?

13, 3, 7, 9, 11, 9, 10, 5, 3 **Mode = 3 & 9**

Note: There can be more than one mode.

Work out the mode for each list of scores. There may be more than one answer.

(11) 4, 4, 5, 5, 5, 6, 6, 8, 9, 9, 11 _____

(12) 10, 10, 8, 9, 5, 8, 9, 7, 8 _____

(13) 13, 7, 9, 10, 7, 10, 7, 10, 11, 10, 7 _____

(14) 5, 3, 7, 5, 3, 5, 3, 5, 4, 6, 8, 3 _____

Every time a T-shirt is sold, its size is noted. Below is a list of the sizes sold.



12, 10, 8, 8, 12, 10, 8, 10, 10, 8, 12, 10

(15) **Work out the mode** for these t-shirt sizes.

Knowing the spread (range) of the scores can be helpful. The **range** is worked out by ...

Range = highest score - lowest score

Example: What is the range of these scores?

10, 6, 7, 9, 11, 7, 8, 5, 3 **Range = 11 - 3 = 8**



Work out the range of each group of scores.

(16) 63, 95, 112, 54, 37, 40, 94 _____

(17) 106, 54, 93, 42, 174, 73, 66 _____

(18) 59, 115, 140, 63, 262, 97 _____

(19) 94, 443, 119, 154, 71, 335, 29 _____

Some of the pupils in Room 3 have had their weight measured in kilograms, as shown below.

51.3, 44.8, 48.7, 66.4, 57.3, 45.1, 49.6, 59.3, 41.5



(20) **Work out the range** of weights for these pupils.



The aim of this activity sheet is to work out the three types of 'averages' (mean, median and mode) and the range for a group of scores.

Suggested extension activity:

Collect or create a list of scores (numbers) and using these scores, work out the three 'averages' and range of the scores.

Example: The hours spent playing computer games etc.

Think about which average is the best to use and why

Sign when completed: _____

Statistical graphs and data can be misleading.
 Example: Five purchases at the clothes shop were as follows ...

\$5.00, \$8.50, \$9.20, \$6.75, \$150.00



The shop-keeper said, "I've had some really good sales today with an average (mean) sale of \$35.89."

Was the shop-keeper's statement correct?

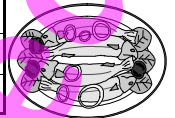
Answer: Not really, as 4 out of the 5 sales were under \$10.00.

The data below shows how many people ate at a local restaurant, what they ate and how long they stayed.

Size of group	Choice for main meal	Total cost of meal	Time spent at restaurant
3 people	P, C, F	\$53.00	2¼ hrs
5 people	B, F, C, F, C	\$108.50	5 hrs
2 people	C, B	\$39.50	2½ hrs
4 people	C, B, C, F	\$91.50	5 hrs
3 people	B, C, B	\$55.50	3½ hrs
6 people	P, B, C, B, F, C	\$151.50	4 hrs
3 people	P, C, F	\$54.00	2¼ hrs
5 people	F, B, P, C, C	\$98.00	6 hrs
6 people	C, F, P, P, B, F	\$135.00	5 hrs
3 people	B, F, C	\$67.50	3½ hrs



Key for main meals
 C = chicken
 F = fish
 B = beef
 P = pork



Study this data, work out some calculations (show your working) and then come up with a statement under the following headings

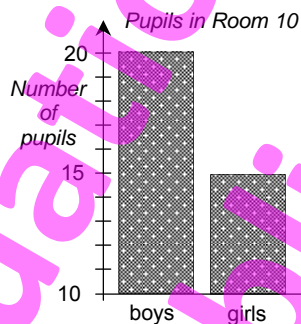
- (5) Group size: _____
- (6) Main meal selection: _____
- (7) Meal costs: _____
- (8) Time spent at restaurant: _____
- (9) Draw a graph to display the main meals selected.

Read the comments about each statistical graph / data. Are the comments correct? Explain your answer.

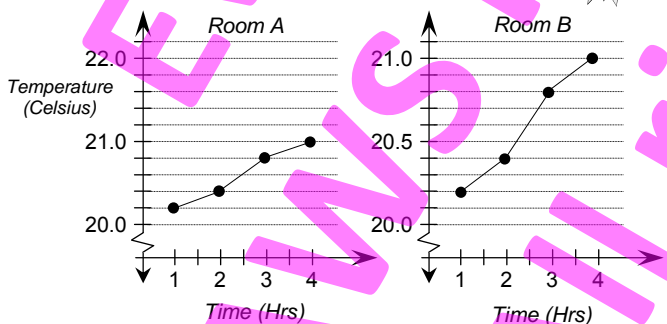
- (1) William recorded the eye colour of the pupils in Room 7. "Most pupils have brown eyes." said William. Is his statement correct?

Eye Colour	Frequency
light blue	6
brown	15
hazel	9
grey	5
	35

- (2) The graph shows the number of boys and girls in Room 10. "There are twice as many boys than girls." said Carol.



The graphs below show how the temperature in two rooms changed over time.



- (3) In which room does the rate of temperature change appear to occur faster? _____
- (4) Study both graphs and comment on what you notice. Is your answer in Q3 correct?

The aim of this activity sheet is to interpret statistical graphs and statements made about them. Given some data, organize the data and create a report.

Suggested extension activity:
 Look for statistical graphs or data displays in newspapers or magazines. Ask your child to look at the features that make the data displays stand out. Do they correctly represent the facts or are they misleading?

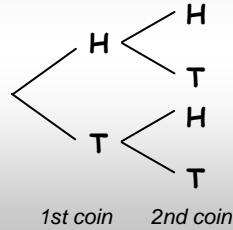
Sign when completed: _____

An **outcome** is what happens when you have a choice. Sometimes finding all possible outcomes can be difficult. Using a **box / grid** or **tree diagram** can help.

Example: Two coins are tossed in the air.

	H	T
H	HH	HT
T	TH	TT

How many outcomes are there?



Answer: four

HH = head/head, HT = head/tail, TH = tail/head & TT = tail/tail.

For lunch, Rosie has a choice of either a ham roll (HR), a salad roll (SR) and a choice of either an apple (A), an orange (O), a pear (P) or a banana (B).

- (1) Guess how many possible food choices or outcomes you think Rosie has for lunch? _____
- (2) Draw a box / grid to work out what Rosie can eat at lunchtime. (Write letters only)

- (3) What does HR/P mean? _____
- (4) List all possible choices.

- (5) How many choices (outcomes) does Rosie have? _____

Stu has to make a doctor's appointment for either Monday, Wednesday or Friday, either in the morning or the afternoon.

- (6) Draw a tree diagram to show all possible outcomes.

- (7) How many possible outcomes are there? _____
- (8) What is the probability of Stu going to the doctor on Wednesday afternoon? _____

This pack of number cards are to be used for a game of memory.



2	3	1	3	5	2	5	2	4	1	4	3
1	4	2	4	1	5	1	3	4	3	2	2
4	4	5	3	4	2	5	2	1	5	3	1
2	4	1	3	4	1	4	2	2	4	5	4
1	2	5	4	1	4	5	1	2	2	3	3



- (9) Use this tally chart to organize the data above.
- (10) What is the probability of turning over a number 3 card?
_____ out of _____ or as a fraction _____
- (11) What is the probability of turning over a number 1 card?
_____ out of _____ or as a % _____
- (12) The card you have just turned over had a probability of $\frac{3}{20}$ of being selected. What number was on the card? _____
- (13) The card you have just turned over had a probability of 25% of being selected. What number was on the card? _____

Number	Tally	Total
1		
2		
3		
4		
5		

20 new cards are added to this pack.

8x 1, 1x 2, 2x 3, 3x 4 and 6x 5.

- (14) Work out the new probabilities for selecting a number card at random from this pack.

Number	Fraction	Percentage
1		
2		
3		
4		
5		



The aim of this activity sheet is to investigate simple probability, working out the chance of something happening. Probability can be expressed as a fraction, such as $\frac{1}{4}$, which means one out of four.

Suggested extension activity:

Create similar questions as on this activity sheet to reinforce simple probability.

Example: Place 5 red, 3 green and 2 white blocks in a bag.

Ask your child to select a particular coloured block and describe the chance of selecting that block ... 2 out of 10 chances (a white block).

Sign when completed: _____

Curriculum Strand Worksheet Answers

1	
(1)	nine point four
(2)	six hundred and five
(3)	eighty-nine point six
(4)	nine hundred and eighteen point seven
(5)	four thousand, seven hundred and thirteen
(6)	1's 4
(7)	10's 70
(8)	$\frac{1}{100}$'s $\frac{5}{100}$
(9)	$\frac{1}{10}$'s $\frac{3}{10}$
(10)	$\frac{1}{1000}$'s $\frac{3}{1000}$
(11)	1430 1400 1000
(12)	5640 5600 6000
(13)	3970 4000 4000
(14)	13910 13900 14000
(15)	41850 41900 42000
(16)	6.5
(17)	32.8
(18)	19.8
(19)	342.7
(20)	70.3
(21)	0.0151, 0.153, 1.59, 15.7, 154, 1530
(22)	15.9786, 15.9867, 15.9876, 16.0000, 16.5789, 16.5798, 16.5879

2	
(1)	$209 + 8 = 217$
(2)	$809 + 340 = 1149$
(3)	$3000 + 36 = 3036$
(4)	$190 + 46 = 236$
(5)	$880 + 82 = 962$
(6)	$400 = 162 = 562$
(7)	$600+300+10+80+3+6=999$
(8)	$600+200+90+30+5+3=928$
(9)	$800-300+30-20+9-7=512$
(10)	$400 - 9 + 3 = 394$
(11)	$870 - 7 + 4 = 867$
(12)	$970 - 9 + 1 = 962$
(13)	$98 - 60 = 38$
(14)	$244 - 200 = 44$
(15)	$875 - 250 = 625$
(16)	$4 + 30 + 3 = 37$
(17)	$1 + 360 + 7 = 368$
(18)	$3 + 550 + 3 = 556$
(19)	116 (24) 125
(20)	571 (25) 232
(21)	318 (26) 272
(22)	248 (27) 204
(23)	224

3	
(1)	$60 - 4 = 56$
(2)	$200 - 2 = 198$
(3)	$380 - 4 = 376$
(4)	$49 + 96 = 50 + 95$
(5)	$128 + 54 = 130 + 52$
(6)	$241 - 74 = 247 - 80$
(7)	2277
(8)	2102
(9)	\$2230
(10)	374
(11)	2844
(12)	401
(13)	3505
(14)	\$638

4	
(1)	149.58
(2)	220.6
(3)	\$223.45
(4)	46.4
(5)	6.577
(6)	11.148
(7)	122.25
(8)	\$21.90
(9)	\$28.10
(10)	\$1613.20
(11)	\$386.80

5	
(1)	$(100 \times 5) + (60 \times 5) + (7 \times 5) = 500 + 300 + 35 = 835$
(2)	$(200 \times 6) + (10 \times 6) + (3 \times 6) = 1200 + 60 + 18 = 1278$
(3)	$(300 \times 7) + (80 \times 7) + (6 \times 7) = 2100 + 560 + 42 = 2702$
(4)	$(400 \times 8) + (90 \times 8) + (2 \times 8) = 3200 + 720 + 16 = 3936$
(5)	$(600 \times 6) - (3 \times 6) = 3600 - 18 = 3582$
(6)	$(800 \times 7) - (10 \times 7) = 5600 - 70 = 5530$
(7)	$(600 \times 8) + (7 \times 8) = 4800 + 56 = 4856$
(8)	$(800 \times 9) + (5 \times 9) = 7200 + 45 = 7245$
(9)	801
(10)	2076
(11)	2443
(12)	2152
(13)	15925
(14)	31424
(15)	99008
(16)	239133
(17)	\$139860

6	
(1)	$(60 \div 6) + (36 \div 6) = 10 + 6 = 16$
(2)	$(70 \div 7) + (63 \div 7) = 10 + 9 = 19$
(3)	$(80 \div 8) + (56 \div 8) = 10 + 7 = 17$
(4)	$(90 \div 9) + (72 \div 9) = 10 + 8 = 18$
(5)	$(800 \div 2) - (24 \div 2) = 400 - 12 = 388$
(6)	$(2100 \div 7) - (14 \div 7) = 300 - 2 = 298$
(7)	$(1800 \div 9) + (45 \div 9) = 200 + 5 = 205$
(8)	$(3200 \div 8) + (16 \div 8) = 400 + 2 = 402$
(9)	$432 \div 12 = 216 \div 6 = 108 \div 3 = 36$
(10)	$192 \div 16 = 96 \div 8 = 48 \div 4 = 12$
(11)	$1280 \div 40 = 640 \div 20 = 320 \div 10 = 32$
(12)	$576 \div 24 = 288 \div 12 = 144 \div 6 = 24$
(13)	24 (16) 134 r5
(14)	65 (17) 171 r7
(15)	154 (18) 216 r4
(19)	98 (22) 178 r5
(20)	50 (23) \$378
(21)	17 (24) \$2465

7	
(1)	1.476
(2)	0.0932
(3)	25.194
(4)	31.84
(5)	676.24km
(6)	1298.5km
(7)	$10298 \times 0.015 = \$154.47$
	$25642 \times 0.015 = \$384.63$
(8)	6.5
(9)	8.2
(10)	1391
(11)	0.362
(12)	$15.375 = 15.38 \text{ 2d.p.}$
(13)	$3.555 = 3.56 \text{ 2d.p.}$
(14)	\$15.95



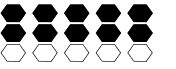


8	
(1)	prime
(2)	multiples
(3)	factor
(4)	1, 2, 3, 5, 7, 11, 13, 17
(5)	61, 67, 71, 73, 79, 83, 89
(6)	(29), (31), 33, 35, (37), 39, 45, (47), 49, 51
(7)	8, 16, 24, 32, 40, 48, 56, 64, 72, 80
(8)	35, 42, 49, 56
(9)	54, 63, 72, 81, 90, 99, 108, 117
(10)	1, 3, 5, 15
(11)	1, 2, 3, 4, 6, 9, 12, 18, 36
(12)	1, 2, 4, 13, 26, 52
(13)	49 (15) 81
(14)	36 (16) 144
(17)	169
(18)	8 (20) 9
(19)	11 (21) 20
(22)	7 metres
(23)	$2 \times 2 \times 2 \times 2 \times 2 = 32$
(24)	$3 \times 3 \times 3 \times 3 = 81$
(25)	$6 \times 6 \times 6 = 216$
(26)	$10 \times 10 \times 10 \times 10 = 10000$

9

(1) 61 (11) 40
 (2) 60 (12) 60
 (3) 4 (13) 66
 (4) 24 (14) 60
 (5) 29 (15) 63
 (6) 30 (16) 45
 (7) 53 (17) 18
 (8) 40 (18) 10
 (9) 33 (19) 87
 (10) 25 (20) 36

(21) $2 \times 20 = 40$
 (22) $5 \times 12 = 60$
 (23) $6 \times 13 = 78$
 (24) $3 \times 25 = 75$
 (25) $5 \times 9 = 45$
 (26) $6 \times 4 + 9 = 33$
 (27) $25 - 5 \times 3 = 10$
 (28) $18 \div 6 + 7 = 10$
 (29) $7 + 6 \times 8 - 9 = 46$
 (30) $6 \times 7 - 27 \div 9 = 39$
 (31) $7 \times 5 - 4 = 31$ days
 (32) $9 \times 8 + 4 \times 5 = 72 + 20 = \92

10

(1) 
 (2) 
 (3) 
 (4) 
 (5) 
 (6) $\frac{7}{14}$ (11) $\frac{1}{5}$
 (7) $\frac{12}{18}$ (12) $\frac{3}{4}$
 (8) $\frac{27}{36}$ (13) $\frac{4}{5}$
 (9) $\frac{16}{40}$ (14) $\frac{3}{5}$
 (10) $\frac{35}{56}$ (15) $\frac{5}{7}$
 (16) $\frac{1}{2}$ (21) $\frac{13}{19}$
 (17) $\frac{2}{3}$ (22) $\frac{5}{9}$
 (18) $\frac{7}{8}$ (23) $\frac{2}{3}$
 (19) $\frac{4}{5}$ (24) $\frac{37}{100}$
 (20) $\frac{7}{10}$ (25) $\frac{13}{20}$
 (26) $\frac{16}{20}$ OR $\frac{4}{5}$

11

(1) 20
 (2) 54
 (3) 60
 (4) 56
 (5) 32
 (6) $6000 \div 4 = 1500 \times 3 = 4500$ m
 (7) $60 \div 3 = 20 \times 2 = 40$ minutes
 (8) $120 \div 8 = 15 \times 3 = 45$ rolls
 (9) 84 pages
 (10) 48 km
 (11) 168 runs
 (12) \$52
 (13) 120 pages
 (14) 36 km
 (15) $8 \frac{1}{2}$ (20) $9 \frac{2}{5}$
 (16) $8 \frac{1}{3}$ (21) $9 \frac{4}{6}$
 (17) $4 \frac{2}{4}$ (22) $9 \frac{2}{7}$
 (18) $4 \frac{1}{5}$ (23) $9 \frac{3}{8}$
 (19) $4 \frac{4}{6}$ (24) $7 \frac{2}{9}$
 (25) $\frac{21}{4}$ (30) $\frac{31}{8}$
 (26) $\frac{20}{3}$ (31) $\frac{23}{4}$
 (27) $\frac{18}{5}$ (32) $\frac{68}{9}$
 (28) $\frac{47}{6}$ (33) $\frac{48}{7}$
 (29) $\frac{41}{9}$ (34) $\frac{29}{3}$

12

(1) 0.25 (3) 0.4
 (2) 0.7 (4) 0.375
 (5) $\frac{4}{10} = \frac{2}{5}$
 (6) $\frac{9}{10}$
 (7) $\frac{80}{100} = \frac{4}{5}$
 (8) $\frac{67}{100}$
 (9) $\frac{5}{100} = \frac{1}{20}$
 (10) $0.6 \times 100 = 60\%$
 (11) $0.35 \times 100 = 35\%$
 (12) $0.69 \times 100 = 69\%$
 (13) $0.87 \times 100 = 87\%$
 (14) $2.25 \times 100 = 225\%$
 (15) $60 \div 100 = 0.6$
 (16) $75 \div 100 = 0.75$
 (17) $25 \div 100 = 0.25$
 (18) $92 \div 100 = 0.92$
 (19) $342 \div 100 = 3.42$
 (20) $\frac{60}{100} = \frac{6}{10} = \frac{3}{5}$
 (21) $\frac{75}{100} = \frac{15}{20} = \frac{3}{4}$
 (22) $\frac{94}{100} = \frac{47}{50}$
 (23) $\frac{17}{100}$
 (24) $\frac{125}{100} = \frac{5}{4} = 1 \frac{1}{4}$

fraction	decimal	percentage
(25) $\frac{1}{2}$	(26) 0.5	50%
$\frac{1}{4}$	(27) 0.25	(28) 25%
(29) $\frac{3}{4}$	0.75	(30) 75%
(31) $\frac{1}{3}$	(32) 0.33	33 $\frac{1}{3}\%$
(33) $\frac{3}{5}$	0.6	(34) 60%
$\frac{2}{3}$	(35) 0.66	(36) 66 $\frac{2}{3}\%$

13

(1) 530 (5) 9185000
 (2) 27000 (6) 5623000
 (3) 85600 (7) 4200
 (4) 2.6 (8) 870000
 (9) Shift the decimal point **right**, by the same number of places as there are zeros in the power of 10.
 (10) 0.021 (14) 0.0072
 (11) 0.00253 (15) 0.078061
 (12) 0.678 (16) 0.00094
 (13) 0.1439 (17) 0.076
 (18) Shift the decimal point **left**, by the same number of places as there are zeros in the power of 10.
 (19) 2700
 (20) 0.000064
 (21) 9200000
 (22) 0.51
 (23) 830
 (24) 0.0045
 (25) \$2500
 (26) \$1650
 (27) All balloons weighed 1.5kg
 One balloon weighs 0.0015kg or 1.5g

14

(1) 10m
 (2) 4m, 7m, 8m
 (3) Show bird on diagram
 (4) -9m
 (5) -5m
 (6) -2m, -6m, -8m, -10m
 (7) -7m
 (8)

Withdrawal	Deposits	Balance
		200.00
165.50		34.50
	115.60	150.10
340.00		-189.90
	115.60	-74.30
43.75		-118.05
	115.60	-2.45
		-\$2.45

(9) -4°C
 (10) 17°C
 (11) 1°C
 (12) 5°C
 (13) -16°C

15

(1) a = 146
 (2) d = 72
 (3) e = 442
 (4) f = 433
 (5) m = 637
 (6) n = 83
 (7) p = 9
 (8) q = 70
 (9) s = 12
 (10) t = 290
 (11) d = 8
 (12) f = 12
 (13) g = 9
 (14) h = 10
 (15) k = 11
 (16) g = 12
 (17) k = 15
 (18) m = 203
 (19) d = 6
 (20) b = 14
 (21) $3r - 7 = 53$

16

(1) C = \$1.20r
 (2)

Number of packets	Total cost
0	\$0.00
1	\$1.20
2	\$2.40
5	\$6.00
10	\$12.00
15	\$18.00
20	\$24.00
50	\$60.00
90	\$108.00

(3) 3 books: C = \$25
 8 books: C = \$100
 10 books: C = \$130
 (4) 6 books
 (5) 24 books
 (6) \$30
 (7) \$20
 (8) \$2
 (9) C = \$2n + \$10
 (10) 9 books: \$28
 13 books: \$36
 25 books: \$60

17

(1)

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	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

(2) 4, 11, 18, 25, 32, 39, 46

(3) 7

(4) \$1.65, \$3.30, \$4.95, \$6.60, \$8.25

(5) 8

(6) 12

(7) 10, 13, 16, 19, 22

(8) 1, 5, 9, 13, 17

(9) 7, 12, 17, 22, 27

(10) 3, 10, 17, 24, 31

(11) 13, 17, 21, 25, 29

(12) 37, 32, 27, 22, 17

(13) 9, 16, 23, 30, 37

(14) -3, -1, 1, 3, 5

(15) 5th term: 33
12th term: 96
20th term: 168
100th term: 888

(16) 50

18

Possible answers:

(1) - distance around school grounds,
- height of a lamp post,
- length of a running track,
- lengths of material.

(2) - distance between 2 cities,
- distance between 2 countries

(3) - length of a pencil,
- size of a text book

(4) - width of a pencil,
- thickness of a matchstick

(5) 1800 (13) 1.5

(6) 4250 (14) 13.5

(7) 7.2 (15) 140

(8) 4.28 (16) 572

(9) 710 (17) 4.1

(10) 395 (18) 8.43

(11) 4.2 (19) 3200

(12) 5.75 (20) 9540

(21) $800 + 5300 + 7.5 = 6107.5\text{m}$

(22) $0.85 \times 9 = 7.65\text{m}$

(23) $910 - 649 = 261\text{mm}$

(24) $740 - 580 = 160\text{cm}$

(25) $3.5 + 6.1 + 0.94 = 10.54\text{km}$

(26) $1247 - 805 = 442\text{mm}$

(27) $370 + 83 + 52 = 505\text{cm}$

(28) $8.43 - 7.95 = 0.48\text{km}$

(29) 14.3m

(30) 7.8m

19

Possible answers:

(1) - a piece of fruit,
- a small plastic toy,
- a piece of bread,
- empty coffee cup,
- packet of biscuits

(2) - a car, a truck

(3) - an animal, a bag of potatoes

(4) - a feather, a toothpick

(5) 8700 (13) 0.862

(6) 9320 (14) 2700

(7) 650 (15) 9070

(8) 6.1 (16) 560

(9) 4.28 (17) 3.2

(10) 0.75 (18) 7.25

(11) 8.2 (19) 4900

(12) 1.76 (20) 6650

(21) $7 + 9.5 + 430 = 446.5\text{kg}$

(22) $6.3 - 3.9 = 2.4\text{kg}$

(23) $12.4 - 8.75 = 3.65\text{t}$

(24) $6800 - 4920 = 1880\text{g}$

(25) $9180 - 3800 = 5380\text{mg}$

(26) $850 + 264 + 4.1 = 1118.1\text{g}$

(27) $0.63 \times 9 = 5.67\text{kg}$

(28) $5400 \div 9 = 600\text{mg}$

(29) $24000 \div 400 = 60$ loaves

(30) $0.523 + 0.274 + 0.35 + 0.495 + 1.16 = 2.802\text{t}$

20

Possible answers:

(1) - water in a kitchen sink,
- paint in a tin,
- milk in a carton,
- petrol in a cars tank,
- water in an aquarium
- water in a lake,

(2) - water in an ocean

(3) - medicine on a spoon,
- coffee in a cup

(4) 7500 (10) 2.7

(5) 1840 (11) 3.95

(6) 625 (12) 0.48

(7) 5.3 (13) 7500

(8) 4.18 (14) 9230

(9) 0.375 (15) 354

(16) 6.85L

(17) 5500mL

(18) 0.75L

(19) $600 + 7.1 + 3.72 = 610.82\text{L}$

(20) $7.35 - 3.7 = 3.65\text{kL}$

(21) $8350 - 7800 = 550\text{mL}$

(22) $9.35 - 6.93 = 2.42\text{L}$

(23) $8490 - 5360 = 3130\text{mL}$

(24) $4900 + 3100 + 1.9 = 8001.9\text{L}$

(25) $0.58 \times 6 = 3.48\text{kL}$

(26) $7.28 \div 8 = 0.91\text{L}$

(27) $0.5 + 4 + 10 + 0.025 = 14.525\text{L}$

(28) 150 cups

(29) $25 - 1.2 = 23.8\text{kL}$

21

(1) clockwise

(2) anti-clockwise

(3) angle

(4) degrees

(5) protractor

(6) compass

(7) ruler

(8) right

(9) straight

(10) acute

(11) obtuse

(12) reflex

(13) perpendicular

(14) parallel

(15) $\angle BED$ or $\angle DEB$

(16) Check diagram

(17) AF and FE

(18) AC and FE

(19) $\angle EBC$, $\angle FAB$, $\angle BCD$

(20) Check diagram

(21) anti-clockwise

22


(1) 48mm is the same as 4.8cm

(2) Line AB = 24mm
Line CD = 46mm
Line EF = 49mm
Line GH = 41mm
All the above answers could be $\pm 1\text{mm}$

(3) Draw a 7.2cm line

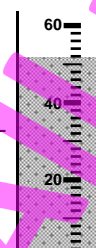
(4) 54kg

(5) 103kg

(6) 

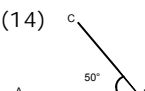
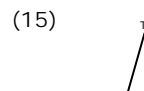
(7) millilitres

(8) 35mL

(9) Draw a new level at 52mL as shown 

(10) 35° (12) 57°

(11) 122° (13) 123°

(14)  (15) 

23

(1) $\angle a = 130^\circ$ $\angle b = 50^\circ$

(2) yes

(3) $\angle a = 98^\circ$
 $\angle b = 46^\circ$
 $\angle c = 43^\circ$
 $\angle d = 66^\circ$
 $\angle e = 8^\circ$

(4) $\angle a = 130^\circ$
 $\angle b = 105^\circ$
 $\angle c = 125^\circ$

(5) yes

(6) $\angle f = 97^\circ$
 $\angle g = 236^\circ$
 $\angle h = 117^\circ$
 $\angle j = 98^\circ$
 $\angle k = 40^\circ$

(7) $\angle a = 80^\circ$
 $\angle b = 70^\circ$
 $\angle c = 30^\circ$

(8) yes

(9) $\angle m = 81^\circ$
 $\angle n = 19^\circ$
 $\angle p = 75^\circ$
 $\angle s = 118^\circ$
 $\angle t = 62^\circ$

(10) 15°

(11) 120°

24

(1) 35cm

(2) 56m

(3) 44.5m

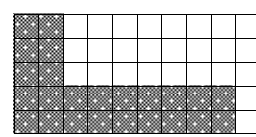
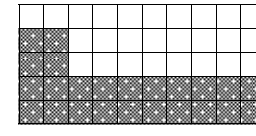
(4) 114cm

(5) 12m

(6) 34m

(7) 230m

(8) 28m

(9) 
or


25

- 1 row = 15 squares
Area = 4 rows of 15
= 60 sq units
- 24m²
- 60m²
- 90m²
- area = base x height
- 24cm²
- 48m²
- 36m²
- 125cm²
- 108cm²
- 4500m²
- 81m²
- 8cm
- 12m
- 108m²
- 216m²
- 14.4L
- 4 cans = \$339.80



26

- 35m²
- 30cm²
- 10m²
- 6m²
- 45cm²
- 56cm²
- 14m²
- 32m²
- 12cm
- 8cm
- 18cm
- 12m
- 10.5m²
- \$2625.00
- 112m²

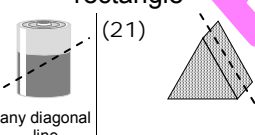
27

- 54m³
- 126m³
- 37.5m³
- 7 x 6 x 5 = 210mm³
- 60 x 50 x 45
= 135000cm³
- 10 x 8.5 x 5 = 425m³
- 20 x 30 x 6 = 3600cm³
- 2cm
- 14.4m³
- 75m³
- 27m³
- 3 hours

28

-  9:15 a.m.
09:15
-  1:40 p.m.
13:40
- 1525
- 0930
- 2
- 45 minutes
- 12:20
- 1:05 p.m.
- 1cm = 5km
- 5cm = 25km
- 6cm = 30km
- 4.5cm = 22.5km
- Town E should be shown as 1.5cm from Town D

29

- circle
- oval (ellipse)
- triangle
- square
- rectangle
- diamond (rhombus)
- parallelogram
- pentagon
- hexagon
- octagon
- cube
- cuboid (rectangular prism)
- sphere (ball)
- cylinder
- triangular prism
- cone
- oval (ellipse)
- circle
- rectangle
-  (21)
- cylinder
- cuboid (rectangular prism)
- triangular prism

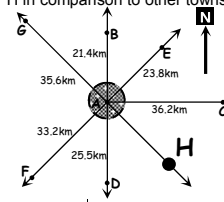
30

- 2C = Weedons,
5A = Taitapu,
4D = Islington,
4C = Prebbleton
- Lincoln College (3A)
Ruapuna (3D)
- diamond (rhombus)
- squares (1,6) (2,2)
circles (2,4) (4,1)
triangles (1,1) (3,6)
(4,3)
- square
- parallelogram
- rectangle
- diamond (rhombus)
- octagon

31

(1) E	(4) NE
(2) S	(5) SW
(3) W	(6) NW

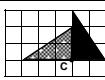
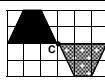
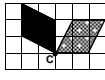
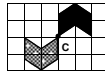
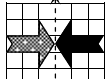
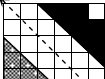
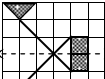
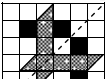
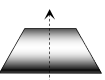
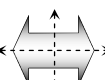
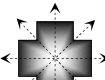
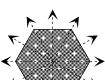
(7) B
(8) E
(9) N 21.4km
(10) E 36.2km
(11) S 25.5km
(12) NE 23.8km
(13) SW 33.2km
(14) NW 35.6km
(15) Please note: This diagram is not to scale, but shows the position of Town H in comparison to other towns.



(16) 20°	(19) 100°
(17) 50°	(20) 290°
(18) 150°	(21) 230°

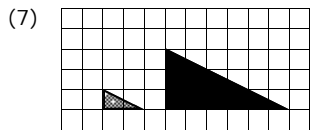
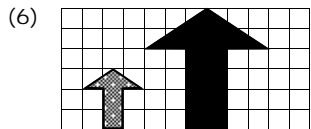
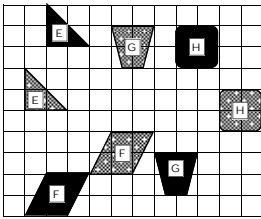
(22) Mark V at 320°
(23) 75°
(24) 155°
(25) 95°

32

-  (2) 
-  (4) 
- 90° clockwise or 270° anti-clockwise about point B
-  (7) 
-  (9) 
-  (12) 
-  (13) 
- Draw a design
- Draw a design

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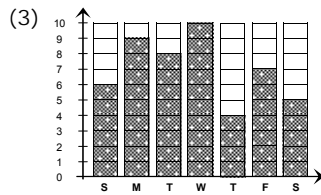
- (1) 4 right, 3 down
- (2) 3 right, 1 up
- (3) 4 left, 2 down
- (4) 3 left, 3 up



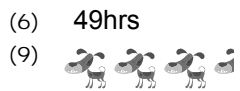
- (8) scale factor = 2

34

- (1) (S) = 9 (C) = 6
- (2) Show 8 tennis players in column (T)



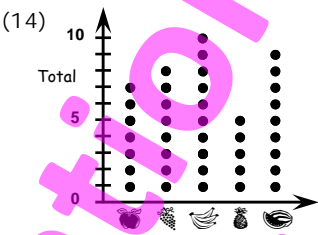
- (4) 10 (7) 13 cats
- (5) T = Tue (8) 7 dogs



- (10) a: A A A A A A
- e: B B B B B
- i: C C C C C
- o: D D D D D
- u: E E E

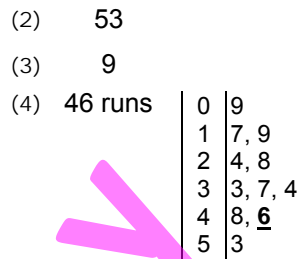
- (11) 🚗 = 16, 🚚 = 12, 🚛 = 4
- (12) 🏍️ = 8

- (13) Draw 4 dots (8 bikes) on dot plot graph

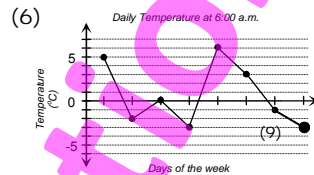


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- (1) 9, 17, 19, 24, 28, 33, 37, 34, 48, 53



- (5) 6 | 1, 8, 5
- 7 | 8, 5, 7, 2
- 8 | 4, 9, 0
- 9 | 2, 4
- 20 | 1, 0
- 21 | 3, 6, 9, 0
- 22 | 9, 7, 4
- 23 | 5, 5, 7



- (7) -2°C, 6°C
- (8) 9°C
- (9) See above graph

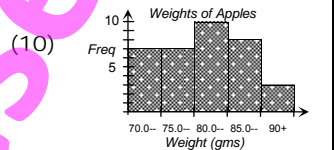
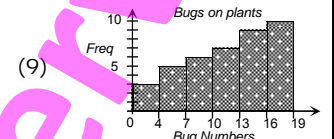
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# of bugs	Tally	F
0-3	III	3
4-6	HHH	5
7-9	HHH I	6
10-12	HHH II	7
13-15	HHH IIII	9
16-19	HHH HHH	10
		40

- (2) 16-19 (3) 0-3

Weight (gms)	Tally	F
70.0--	HHH II	7
75.0--	HHH II	7
80.0--	HHH HHH	10
85.0--	HHH IIII	8
90+	III	3
		35

- (5) 79.99gms
- (6) 18 apples
- (7) 4 cyclists
- (8) 12 cyclists



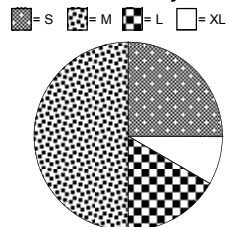
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- (1) 12 sectors
- (2) 3 pupils
- (3) 6 pupils
- (4) 1/6
- (5) 9 pupils
- (6) 25%
- (7) 4+ pupils

F	Each sector = 4 fruits
16	Check key & pie graph
4	🍎 = 4 sectors
8	🍌 = 1 sector
12	🍌 = 2 sectors
40	🍌 = 3 sectors

- (9) check sector sizes
- (10) 1/3
- (11) 40%
- (12) Sector angle calculations
 $30/120 = 1/4, \Rightarrow 1/4 \times 360^\circ = 90^\circ$
 $60/120 = 1/2, \Rightarrow 1/2 \times 360^\circ = 180^\circ$
 $20/120 = 1/6, \Rightarrow 1/6 \times 360^\circ = 60^\circ$
 $10/120 = 1/12, \Rightarrow 1/12 \times 360^\circ = 30^\circ$

- (13) T-shirt size key:



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- (1) $81 \div 4 = 20.3$ (1 d.p.)
- (2) $160 \div 3 = 53.3$ (1 d.p.)
- (3) $191 \div 4 = 47.8$ (1 d.p.)
- (4) $164 \div 6 = 27.3$ (1 d.p.)
- (5) $223 \div 6 = 37.5$ km
- (6) 25
- (7) 48
- (8) 26
- (9) 23.5
- (10) 4 books
- (11) 5
- (12) 8
- (13) 7 & 10
- (14) 3 & 5
- (15) size 10
- (16) $112 - 37 = 75$
- (17) $174 - 42 = 132$
- (18) $262 - 59 = 203$
- (19) $443 - 29 = 414$
- (20) $66.4 - 41.5 = 24.9$ kg

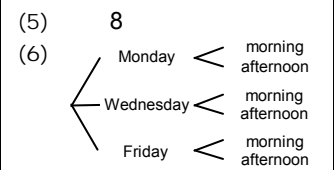
39

- (1) No. Only $15/35$ or 43% of the pupils have brown eyes. That means 57% do not.
- (2) No. The scale on the vertical axis does not start at zero making the boys' column look twice as big as the girls. But, in Room 10 there are 20 boys and 15 girls.
- (3) B
- (4) No. The temperature scales on the vertical axis are different, giving the impression that the rate of change in Graph B is faster. The temperature is the same for both.
- (5) The mode group size is 3. The mean group size is 4.
- (6) C = 14, F = 10, B = 10, P = 6. Most popular meal (mode) is chicken.
- (7) Total cost of meals: \$854
 Mean meal cost = \$21.35 ($854 \div 40 = 21.35$)
- (8) Total group hours: 40hrs
 Mean group time = 4hrs ($40 \div 10$ groups = 4)
- (9) Check graphs drawn
 Possible graphs:
 Column graph,
 Dot plot graph,
 Pie graph

40

	A	O	P	B
HR	HR/A	HR/O	HR/P	HR/B
SR	SR/A	SR/O	SR/P	SR/B

- (3) ham roll and pear
- (4) HR/A, HR/O, HR/P, HR/B, SR/A, SR/O, SR/P, SR/B



- (7) 6 outcomes
- (8) 1 out of 6

Number	Tally	Total
1	HHH HHH II	12
2	HHH HHH IIII	14
3	HHH HHH	10
4	HHH HHH HHH	15
5	HHH IIII	9
		60

- (10) 10 out of 60 or 1/6
- (11) 12 out of 60 or 20%
- (12) 5 (13) 4
- (14)

Number	Fraction	Percentage
1	$20/60$ or $1/3$	25%
2	$15/60$ or $1/4$	18.75%
3	$12/60$ or $1/5$	15%
4	$18/60$ or $3/10$	22.5%
5	$15/60$ or $1/4$	18.75%