

Written in
NZ for NZ

Help Me at HOME Series



Mathematics Student Workbook

Book 8

40x Number Knowledge Worksheets

40x Curriculum Strand Worksheets



This resource covers **Level 5** achievement objectives as outlined in the

Mathematics in the New Zealand Curriculum

for the strands ...

Number & Algebra, Measurement & Geometry and **Statistics**

and supports the **Numeracy Professional Development Project - Stages 7 to 8**

Name: _____ Class: _____

Author: A. W. Stark



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40x Number Knowledge Worksheets
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**This resource supports the
Numeracy Professional Development
Project**

Stages 6 to 8

**and covers Level 8 of the
achievement**

**objectives as outlined in the
*Mathematics in the New Zealand
Curriculum***

for the strands ...

Number & Algebra,

Measurement & Geometry

and Statistics

Name: _____ Class: _____

Author: A. W. Stark



AHS8

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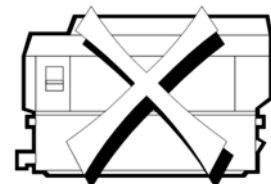
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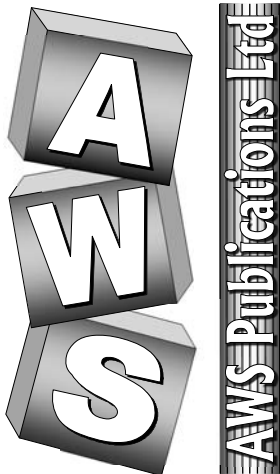
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Note from the author:

About ...

Help Me at Home Student Workbooks

This resource is one of a series of 8 resources written to support the **Numeracy Project** currently being implemented within many New Zealand schools and covers 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.

Note: The Number Knowledge section covers many of the Number & Algebra Achievement Objectives.

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 below.

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 your child learns the numeracy facts is not as important as knowing them.

How to use this resource

40x Number Knowledge Worksheets Section

(Pages 8 to 12, 14 to 18, 20 to 24 & 26 to 30)

- The **40 worksheets** in this section systematically introduce and revise numeracy facts and number knowledge strategies.
- Presented in different formats, these worksheets are designed to reinforce the **Numeracy Development Programme**. It is intended that one worksheet per week is completed in the order presented, from worksheet 1 to worksheet 40.
- One worksheet from the **Curriculum Strand Worksheet** section is selected to be done in conjunction with the **Number Knowledge Worksheet**.
- **Book 8** covers the **Strategy Stages 6 to 8**.

One Worksheet from each section to be completed each week

40x Curriculum Strand Worksheets Section

(Pages 34 to 73)

- The **40 worksheets** in this section 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.
- The **Curriculum Strand Worksheet** selected is to be done in conjunction with the **Number Knowledge Worksheet**.
- The **Curriculum Strand Worksheet** selected relates to the topic being covered at school or as revision.
- **Book 8** covers Level 5 of the **Curriculum**.

4x Number Knowledge Progress Assessments

(Pages 13, 19, 25 & 31)

An oral progress assessment is available after every **10 Number Knowledge** worksheets.

Note to Parents / Care-givers:

- 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.
- The aim of this resource is to provide you with a systematic and comprehensive series of worksheets, offering you guidance as to how mathematics is taught within schools.
- **Each strand worksheet has an EXTENSION activity for you to do with your child to reinforce ideas covered in the worksheet.**

How can you help?

- Sit with your child as they work through each worksheet. Help them to understand what is required from each question, but try to avoid telling them the answers.

Numeracy Facts:

At the back of this resource there is a table of ALL numeracy facts introduced in this resource.

These tables can be used when assessing your child's Number Knowledge skill level.

There is also a 1 to 100 number matrix to assist your child to count in 1's up to 100.

Page	Number Knowledge Worksheet	Curriculum Strand Worksheet Enter the worksheet number you are doing this week	Tick when completed
8	1		
8	2		
9	3		
9	4		
10	5		
10	6		
11	7		
11	8		
12	9		
12	10		
13	Number Knowledge Progress Assessment 1		
14	11		
14	12		
15	13		
15	14		
16	15		
16	16		
17	17		
17	18		
18	19		
18	20		
19	Number Knowledge Progress Assessment 2		

Page	Number Knowledge Worksheet	Curriculum Strand Worksheet Enter the worksheet number you are doing this week	Tick when completed
20	21		
20	22		
21	23		
21	24		
22	25		
22	26		
23	27		
23	28		
24	29		
24	30		
25	Number Knowledge Progress Assessment 3		
26	31		
26	32		
27	33		
27	34		
28	35		
28	36		
29	37		
29	38		
30	39		
30	40		
31	Number Knowledge Progress Assessment 4		

Curriculum Strand Worksheets

(Tick next to worksheet as each ONE is completed)

Page 34	1	Revision	<i>Tick</i>	Page 54	21	Area - Square / rectangle / triangle	<i>Tick</i>
35	2	Addition & subtraction strategies		55	22	Area - Parallelogram / trapezium / circle	
36	3	Multiplication & division strategies		56	23	Circles - circumference & area	
37	4	Working with decimals		57	24	Volume	
38	5	Powers & Order of operations		58	25	Reading and drawing angles	
39	6	Decimal place / Significant figures		59	26	Angle rule revision	
40	7	Fractions / decimals / percentages		60	27	Interior angle sum of polygons	
41	8	Equivalent fractions / simplifying		61	28	Angles & parallel lines	
42	9	More fractions		62	29	Compass points and compass bearings	
43	10	Working with percentages		63	30	Constructions & loci	
44	11	Positive & negative numbers / Integers		64	31	Pythagoras and trigonometry ratios	
45	12	Standard form of ordinary numbers		65	32	Using trigonometry ratios	
46	13	Ratio & rates		66	33	Reflection & Rotation	
47	14	Number patterns or sequences		67	34	Enlargement & Translation	
48	15	'Like' terms, expanding & factorising		68	35	Mean, median, mode and the range	
49	16	Solving linear equations		69	36	Discrete / continuous data and histograms	
50	17	Plotting ordered pairs / linear graphs		70	37	Graphs - 1	
51	18	The metric system		71	38	Box & Whisker graphs and Pie graphs	
52	19	2-D and 3-D shapes / Nets		72	39	Probability calculations	
53	20	Perimeter		73	40	Finding outcomes & probabilities	

Number Knowledge Worksheet Section

The following activities are covered in worksheets 1 to 10:

- **EIGHTY activities involving ...**
 - skip counting in multiples, stating numbers that come before after or between given numbers;
 - writing decimals as number words and number words as decimals;
 - ordering numbers and decimals;
 - adding numbers in a matrix;
 - exploring place value using money, whole numbers and decimals,
 - rounding numbers to the nearest 10, 100, 1000, 10th or 100th and finding estimated answers;
 - finding a fraction of a group of shapes, a whole number or a decimal and creating equivalent fractions;
 - Finding the multiples or factors for given numbers;
 - converting between improper fractions and mixed numbers;
 - converting between commonly used fractions, decimals and percentages;
 - finding a percentage of a whole number or decimal;
 - finding the square or square root of a number;
 - adding and subtracting integers;
- Using appropriate **number strategies** to revise the number **combinations that add up to and include 18**, including subtraction combinations.
Example: $93.04 + 40.6 + 8.3 = \underline{\hspace{2cm}}$, $24.75 + \underline{\hspace{2cm}} + 69 = 130.45$ etc.
- Using appropriate **number strategies** to revise **multiplication and division facts** up to 10×10 .
Example: $368 \times 5 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$ etc.

The following activities are covered in worksheets 11 to 20:

- **EIGHTY activities involving ...**
 - skip counting in multiples, stating numbers that come before after or between given numbers;
 - writing decimals as number words and number words as decimals;
 - ordering numbers and decimals;
 - adding numbers in a matrix;
 - exploring place value using money, whole numbers and decimals,
 - rounding numbers to the nearest 10, 100, 1000, 10th or 100th and finding estimated answers;
 - finding a fraction of a group of shapes, a whole number or a decimal and creating equivalent fractions;
 - finding the multiples and factors for given numbers;
 - converting between improper fractions and mixed numbers;
 - multiplying and dividing large numbers or decimals by 10, 100 or 1000;
 - order of operations, BEDMAS;
 - converting between commonly used fractions, decimals and percentages;
 - finding a percentage of a whole number or decimal;
 - finding the square or square root of a number;
 - adding and subtracting integers;
 - completing ratios;
 - solving equations;
 - simple word problems.
- Using appropriate **number strategies** to revise the number **combinations that add up to and include 18**, including subtraction combinations.
- Using appropriate **number strategies** to revise **multiplication and division facts** up to 10×10 .

The following activities are covered in worksheets 21 to 30:

- **EIGHTY activities involving ...**
 - skip counting in multiples, stating numbers that come before after or between given numbers;
 - writing decimals as number words and number words as decimals;
 - ordering numbers and decimals;
 - adding numbers in a matrix;
 - exploring place value using money, whole numbers and decimals,
 - rounding numbers to the nearest 10, 100, 1000, 10th or 100th and finding estimated answers;
 - rounding numbers and decimal using decimal places or significant figures;
 - finding a fraction of a group of shapes, a whole number or a decimal and creating equivalent fractions;
 - finding the multiples and factors for given numbers;
 - converting between improper fractions and mixed numbers;
 - multiplying and dividing large numbers or decimals by 10, 100 or 1000;
 - converting between ordinary numbers and standard form;
 - order of operations, BEDMAS;
 - converting between commonly used fractions, decimals and percentages,
 - finding a percentage of a whole number or decimal;
 - finding the square or square root of a number and other powers;
 - adding and subtracting integers;
 - adding and subtracting simple fractions;
 - completing ratios;
 - solving equations involving mixed number answers;
 - simple word problems, some involving rates.
- Using appropriate **number strategies** to revise the number **combinations that add up to and include 18**, including subtraction combinations.
- Using appropriate **number strategies** to revise **multiplication and division facts** up to 10×10 .

The following activities are covered in worksheets 31 to 40:

- **EIGHTY activities involving ...**
 - skip counting in multiples, stating numbers that come before after or between given numbers;
 - writing decimals as number words and number words as decimals;
 - ordering numbers and decimals;
 - adding numbers in a matrix;
 - exploring place value using money, whole numbers and decimals,
 - rounding numbers to the nearest 10, 100, 1000, 10th or 100th and finding estimated answers;
 - rounding numbers and decimal using decimal places or significant figures;
 - finding a fraction of a group of shapes, a whole number or a decimal and creating equivalent fractions;
 - finding the multiples and factors for given numbers;
 - converting between improper fractions and mixed numbers;
 - multiplying and dividing large numbers or decimals by 10, 100 or 1000;
 - converting between ordinary numbers and standard form;
 - order of operations, BEDMAS,
 - converting between commonly used fractions, decimals and percentages;
 - finding a percentage of a whole number or decimal;
 - finding the square or square root of a number and other powers;
 - adding and subtracting integers;
 - adding and subtracting simple fractions;
 - completing ratios;
 - solving equations involving mixed number answers;
 - simple word problems, some involving rates.
- Using appropriate **number strategies** to revise the number **combinations that add up to and include 18**, including subtraction combinations.
- Using appropriate **number strategies** to revise **multiplication and division facts** up to 10×10 .

(1) Write in the missing numbers as you skip count in 9's.

_____, 18, _____, _____, _____, _____, 63, _____

81, _____, _____, _____, _____, _____, 135



(2) Round these numbers to the nearest 10.

231 = _____ 683 = _____

1465 = _____ 3249 = _____

(3) What fraction of each group of shapes is shaded? Simplify.



(4) Fill in the missing fractions, decimals or percentages.



fraction	decimal	percentage
1/4	↔	↔
↔	↔	60%
↔	0.7	↔

(5) Adding large numbers. 252

3143 + 732 + 13 = _____ 63

471 + 26 + 534 = _____ 10936

72 + 494 + 4124 = _____ + 512

(6) Subtracting large numbers.

1298 - 53 = _____ 5647

13427 - 965 = _____ - 482

27385 - 3621 = _____

(7) Multiplying large numbers using place value.

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$

$348 \times 4 = (\quad \times \quad) + (\quad \times \quad) + (\quad \times \quad)$

= _____ + _____ + _____ = _____

(8) Dividing large numbers.

$2 \overline{) 756}$ $5 \overline{) 1275}$

$3 \overline{) 612}$ $4 \overline{) 2684}$

(1) Write these numbers in order from smallest to largest.

0.25 2.06

2 20.04

0.029

_____, _____, _____, _____



(2) List the first 5 multiples of these numbers.

2 = _____ 5 = _____

7 = _____ 10 = _____

(3) Round these numbers to the nearest 100.

563 = _____ 946 = _____

1470 = _____ 2150 = _____

(4) Convert these percentages to decimals.

50% = _____ 80% = _____ 25% = _____

37% = _____ 75% = _____ 8% = _____

(5) Adding large numbers. 1675

462 + 14 + 2738 = _____ 81

535 + _____ + 47 = 3412 32523

41 + 972 + _____ = 1670 + 426

(6) Subtracting large numbers.

3286 - _____ = 2516 15539

_____ - 2608 = 974 -

21573 - _____ = 19706 6351

(7) Multiplying whole numbers.

579 341 920

x 5 x 6 x 23

(8) Dividing large numbers using multiples of 10.

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$

$436 \div 4 = (\quad \div \quad) + (\quad \div \quad)$

= _____ + _____ = _____

(1) Skip counting in 8's, write the number that comes after ...



24, _____ 64, _____ 72, _____

(2) Round these numbers to the nearest 10 or 100 and then work out an estimated answer.

$89 + 104 + 493 = \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

$1308 - 783 = \underline{\quad} - \underline{\quad} = \underline{\quad}$

(3) Shade in part of each group of shapes to show you understand these fractions.

$\frac{2}{3}$		$\frac{5}{6}$	
---------------	--	---------------	--

(4) Convert these decimals to percentages.

$0.5 = \underline{\quad}\%$ $0.75 = \underline{\quad}\%$ $0.4 = \underline{\quad}\%$

$0.67 = \underline{\quad}\%$ $0.09 = \underline{\quad}\%$ $0.9 = \underline{\quad}\%$

(5) Adding decimals. 341.8

$93.04 + 40.6 + 8.3 = \underline{\quad}$ 2.8

$4.94 + 5 + 38.7 = \underline{\quad}$ 5291.0

$59 + 1.86 + 94.3 = \underline{\quad}$ + 38.4

(6) Subtracting decimals.

$316.2 - 29.4 = \underline{\quad}$ 38.95

$578.27 - 85.84 = \underline{\quad}$ - 7.28

$298.62 - 43.9 = \underline{\quad}$

(7) Multiplying large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$368 \times 5 = (\underline{\quad} \times \underline{\quad}) - (\underline{\quad} \times \underline{\quad})$

$= \underline{\quad} - \underline{\quad} = \underline{\quad}$

(8) Dividing decimals.

$3 \overline{) 1.68}$

$4 \overline{) 38.08}$

$6 \overline{) 35.4}$

$7 \overline{) 2.702}$

(1) Write these number words as a numeral.

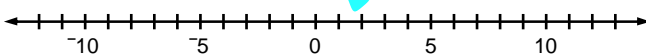
six hundred and two thousand seven hundred and twenty-nine _____

(2) Round these numbers to the nearest 1000.

$6327 = \underline{\quad}$ $1843 = \underline{\quad}$

$32496 = \underline{\quad}$ $10985 = \underline{\quad}$

(3) Add these positive and negative numbers.



$-5 + 9 = \underline{\quad}$ $-8 + 7 = \underline{\quad}$

$13 + -9 = \underline{\quad}$ $3 + -12 = \underline{\quad}$



(4) Find the square of these numbers.

Example: $3^2 = 3 \times 3 = 9$

$6^2 = \underline{\quad}$ $11^2 = \underline{\quad}$

$3^2 = \underline{\quad}$ $15^2 = \underline{\quad}$

(5) Adding decimals. 65.81

$59.36 + 58.9 + 72 = \underline{\quad}$ 0.35

$24.75 + \underline{\quad} + 69 = 130.45$ 472.07

$54 + 9.4 + \underline{\quad} = 81.13$ + 3.98

(6) Subtracting decimals.

$147.1 - \underline{\quad} = 71.9$ 188.35

$\underline{\quad} - 64.38 = 509.36$ -

$264.17 - \underline{\quad} = 218.57$ 93.79

(7) Multiplying decimals.

53.8 9.72 4.15


$\times 4$ $\times 6$ $\times 7.3$

(8) Dividing large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$232 \div 8 = (\underline{\quad} \div \underline{\quad}) - (\underline{\quad} \div \underline{\quad})$

$= \underline{\quad} - \underline{\quad} = \underline{\quad}$

(1) **Skip counting in 7's, write the number that comes before ...** 
 _____, 56 _____, 35 _____, 91

(2) What is the **place value** of the **BOLD** digit and what does it mean?
Example: In 452 the place value is 10's and it means 50.
291 = _____ = _____ **273** = _____ = _____
635 = _____ = _____ **941** = _____ = _____

(3) **Find each fraction of these whole numbers.**
 $\frac{1}{2}$ of 36 = _____ $\frac{1}{4}$ of 32 = _____
 $\frac{2}{3}$ of 27 = _____ $\frac{2}{5}$ of 60 = _____

(4) **Convert these decimals to fractions.**
 0.5 = _____ 0.25 = _____ 0.8 = _____
 0.75 = _____ 0.08 = _____ 0.36 = _____

(5) **Adding large numbers.** 437
 762 + 4835 + 24 = _____ 12980
 74 + 232 + 3489 = _____ 22
 6941 + 86 + 119 = _____ + 508

(6) **Subtracting large numbers.**
 1472 - 617 = _____ 13625
 24063 - 802 = _____ - 945
 75085 - 9626 = _____

(7) **Multiplying large numbers using place value.**
Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$
 $694 \times 7 = (\text{ } \times \text{ }) + (\text{ } \times \text{ }) + (\text{ } \times \text{ })$
 = _____ + _____ + _____ = _____

(8) **Dividing large numbers, some with remainders.**

$$\begin{array}{r} 6 \overline{) 414} \\ \underline{60} \\ 114 \\ \underline{114} \\ 0 \end{array}$$


$$\begin{array}{r} 8 \overline{) 4992} \\ \underline{80} \\ 69 \\ \underline{80} \\ 92 \\ \underline{92} \\ 0 \end{array}$$

$$\begin{array}{r} 7 \overline{) 623} \\ \underline{70} \\ 53 \\ \underline{56} \\ 3 \end{array}$$

$$\begin{array}{r} 9 \overline{) 4839} \\ \underline{90} \\ 38 \\ \underline{36} \\ 23 \\ \underline{27} \\ 9 \end{array}$$

(1) **List the factors of these numbers.**
 10 = _____ 15 = _____
 24 = _____

(2) **Round these numbers to the nearest 10 or 100 and then work out an estimated answer.**
 $356 + 210 + 95 = \text{ } + \text{ } + \text{ } = \text{ }$
 $4867 - 708 = \text{ } - \text{ } = \text{ }$

(3) **Convert these improper fractions to mixed numbers.** *Example: $\frac{11}{4} = 2\frac{3}{4}$*
 $\frac{15}{4} = \text{ }$ $\frac{23}{7} = \text{ }$
 $\frac{34}{6} = \text{ }$ $\frac{41}{9} = \text{ }$ 

(4) **Convert these fractions to decimals.**
 $\frac{1}{2} = \text{ }$ $\frac{1}{4} = \text{ }$ $\frac{2}{3} = \text{ }$
 $\frac{2}{5} = \text{ }$ $\frac{1}{20} = \text{ }$ $\frac{37}{100} = \text{ }$

(5) **Adding large numbers.** 541
 $613 + 4690 + 79 = \text{ }$ 3949
 $71 + \text{ } + 3176 = 3901$ 73
 $2358 + 89 + \text{ } = 3049$ + 260

(6) **Subtracting large numbers.**
 $7238 - \text{ } = 7153$ 3958
 $\text{ } - 649 = 3263$ -
 $11090 - \text{ } = 8127$ 3799

(7) **Multiplying whole numbers.** 742

$$\begin{array}{r} 193 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 257 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} \\ \times 76 \\ \hline \end{array}$$

(8) **Dividing large numbers using multiples of 10.**
Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$
 $945 \div 9 = (\text{ } \div \text{ }) + (\text{ } \div \text{ })$
 = _____ + _____ = _____

(1) Skip counting in 6's, write the number that is between ...



48 ____ 60, 90 ____ 102, 24 ____ 36

(2) Round these numbers to the nearest 10th.

2.43 = ____ 3.74 = ____

37.86 = ____ 60.15 = ____

(3) What is the place value of the BOLD digit and what does it mean?

Example: In 4.52 the place value is $\frac{1}{10}$'s and it means $\frac{5}{10}$.

3.4**6** = ____ = ____ 7.8**2** = ____ = ____

12.5**8** = ____ = ____ 39.3**1** = ____ = ____

(4) Find the square root of these numbers.

Example: $\sqrt{9} = 3$ as $3 \times 3 = 9$

$\sqrt{81} =$ ____ $\sqrt{16} =$ ____

$\sqrt{64} =$ ____ $\sqrt{144} =$ ____

(5) Adding decimals. 0.15

$93.09 + 6.3 + 280.8 =$ ____ 368.25

$2.31 + 382.74 + 69.9 =$ ____ 0.57

$5.205 + 6.78 + 14.67 =$ ____ + 17.80

(6) Subtracting decimals.

$301.8 - 47.4 =$ ____ 584.06

$358.70 - 77.32 =$ ____ - 37.85

$1526.73 - 354.8 =$ ____

(7) Multiplying large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$588 \times 6 = ($ ____ \times ____ $) - ($ ____ \times ____ $)$

$=$ ____ $-$ ____ $=$ ____

(8) Dividing decimals.

$6 \overline{) 3.34}$

$7 \overline{) 1.736}$

$8 \overline{) 49.6}$

$9 \overline{) 37.53}$

(1) Write these number words as decimal numerals.



nine point three zero seven _____

forty-five point two eight three _____

(2) Write two larger equivalent fractions.

$\frac{2}{3} = \frac{2}{5} =$ ____ $\frac{2}{5} =$ ____ = ____

(3) Round these numbers to the nearest 100th.

0.138 = ____ 7.145 = ____

50.342 = ____ 23.0129 = ____

(4) Convert these fractions to percentages.

$\frac{1}{2} =$ ____ $\frac{1}{4} =$ ____ $\frac{2}{5} =$ ____

$\frac{2}{3} =$ ____ $\frac{1}{25} =$ ____ $\frac{5}{8} =$ ____

(5) Adding decimals. 1.80

$367.1 + 2.54 + 82.6 =$ ____ 3.51

$82.14 +$ ____ $+ 9.35 = 675.09$ 48.47

$168.6 + 44.59 +$ ____ $= 233.47$ + 0.93

(6) Subtracting decimals.

$357.8 -$ ____ $= 284.9$ 738.5

____ $- 487.2 = 279.67$ -

$2916.7 -$ ____ $= 2566.91$ 678.9

(7) Multiplying decimals. 53.8

35.8 1.94 x 4.9

x 5 x 8

(8) Dividing large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$873 \div 9 = ($ ____ \div ____ $) - ($ ____ \div ____ $)$

$=$ ____ $-$ ____ $=$ ____

(1) Skip counting in 7's, write the number that comes after ...



49, _____ 77, _____ 28, _____

(2) Round these numbers to the nearest 10th and then work out an estimated answer.

$12.19 + 5.83 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

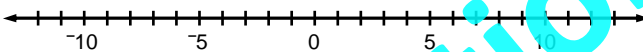
$14.84 - 9.07 = \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(3) Find each fraction of these decimals.

$\frac{1}{3}$ of 27 = _____ $\frac{3}{4}$ of 36 = _____

$\frac{5}{8}$ of 40 = _____ $\frac{4}{7}$ of 49 = _____

(4) Add these positive and negative numbers



$-7 + 12 = \underline{\hspace{2cm}}$

$-5 + 5 = \underline{\hspace{2cm}}$

$11 + -12 = \underline{\hspace{2cm}}$

$9 + -12 = \underline{\hspace{2cm}}$

(5) Adding large numbers. 370

$157 + 1349 + 23 = \underline{\hspace{2cm}}$ 67

$90 + 748 + 2935 = \underline{\hspace{2cm}}$ 2585

$1376 + 20 + 398 = \underline{\hspace{2cm}}$ + 915

(6) Subtracting large numbers.

$4026 - 376 = \underline{\hspace{2cm}}$ 42000

$5802 - 816 = \underline{\hspace{2cm}}$ - 975

$10393 - 937 = \underline{\hspace{2cm}}$

(7) Multiplying large numbers using place value.

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$

$645 \times 7 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$

$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(8) Dividing large numbers.

$$\begin{array}{r} 9 \overline{) 441} \\ \underline{81} \\ 63 \\ \underline{63} \\ 0 \end{array}$$

$$\begin{array}{r} 6 \overline{) 3228} \\ \underline{36} \\ 22 \\ \underline{24} \\ 28 \\ \underline{24} \\ 4 \end{array}$$

$$\begin{array}{r} 8 \overline{) 520} \\ \underline{40} \\ 12 \\ \underline{16} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

$$\begin{array}{r} 7 \overline{) 4473} \\ \underline{49} \\ 37 \\ \underline{35} \\ 27 \\ \underline{28} \\ 93 \\ \underline{91} \\ 23 \\ \underline{21} \\ 2 \end{array}$$

(1) Write these decimals as number words.

2.307 _____

0.069 _____

(2) What is the place value of the BOLD digit and what does it mean?

Example: In 4.52 the place value is $\frac{1}{10}$ s and it means $\frac{5}{10}$.

2.9**7** = _____ = _____ 3.4**8** = _____ = _____

16.3**9** = _____ = _____ 94.6**7** = _____ = _____

(3) Convert these mixed numbers to improper fractions. Example: $4\frac{2}{3} = \frac{14}{3}$

$3\frac{1}{5} = \underline{\hspace{2cm}}$ $7\frac{3}{4} = \underline{\hspace{2cm}}$

$6\frac{2}{3} = \underline{\hspace{2cm}}$ $4\frac{3}{8} = \underline{\hspace{2cm}}$



(4) Convert these percentages to fractions.

50% = _____ 40% = _____ 75% = _____

47% = _____ 64% = _____ 6% = _____

(5) Adding large numbers. 158

$482 + 1312 + 54 = \underline{\hspace{2cm}}$ 3564

$67 + \underline{\hspace{2cm}} + 1398 = 1672$ 27

$2382 + 45 + \underline{\hspace{2cm}} = 2613$ + 318

(6) Subtracting large numbers.

$2986 - \underline{\hspace{2cm}} = 2302$ 3637

$\underline{\hspace{2cm}} - 358 = 4419$ -

$5633 - \underline{\hspace{2cm}} = 3298$ 2241

(7) Multiplying whole numbers. 853

$269 \times 4 = \underline{\hspace{2cm}}$ $326 \times 9 = \underline{\hspace{2cm}}$ x 67

$\underline{\hspace{2cm}} \times 4 = \underline{\hspace{2cm}}$ $\underline{\hspace{2cm}} \times 9 = \underline{\hspace{2cm}}$

(8) Dividing large numbers using multiples of 10.

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$

$1648 \div 8 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$

$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Number Knowledge Progress Assessment 1

Practical / oral assessment: **Ask** each question as outlined below. **Record** the results by circling yes or no

	Practical / Oral Questions (Supply your child with some paper)	Result (circle)																																																																																																																																								
1	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to recite a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																																																								
2	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to write a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																																																								
3	Write up to 10 2, 3, 4 or 5 digit numbers and ask your child to round each number to the nearest 10, 100 or 1000 .	yes / no																																																																																																																																								
4	<p>Addition and subtraction numeracy facts.</p> <p>Tick each correct answer.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> </tr> </thead> <tbody> <tr><td>8 + 18 = 26</td><td></td><td>21 - 7 = 14</td><td></td><td>8 + 16 = 24</td><td></td><td>24 - 2 = 22</td><td></td></tr> <tr><td>25 - 6 = 19</td><td></td><td>13 + 4 = 17</td><td></td><td>36 - 8 = 28</td><td></td><td>8 + 17 = 25</td><td></td></tr> <tr><td>9 + 14 = 23</td><td></td><td>29 - 8 = 21</td><td></td><td>7 + 31 = 38</td><td></td><td>25 - 7 = 18</td><td></td></tr> <tr><td>23 - 2 = 21</td><td></td><td>28 + 2 = 30</td><td></td><td>32 - 5 = 27</td><td></td><td>2 + 37 = 39</td><td></td></tr> <tr><td>31 + 3 = 34</td><td></td><td>21 - 9 = 12</td><td></td><td>19 + 7 = 26</td><td></td><td>22 - 3 = 19</td><td></td></tr> <tr><td>25 - 2 = 23</td><td></td><td>4 + 18 = 22</td><td></td><td>30 - 6 = 24</td><td></td><td>16 + 6 = 22</td><td></td></tr> <tr><td>7 + 15 = 22</td><td></td><td>32 - 8 = 24</td><td></td><td>15 + 6 = 21</td><td></td><td>37 - 2 = 35</td><td></td></tr> <tr><td>26 - 7 = 19</td><td></td><td>44 + 1 = 45</td><td></td><td>24 - 7 = 17</td><td></td><td>19 + 6 = 25</td><td></td></tr> <tr><td>2 + 24 = 26</td><td></td><td>43 - 8 = 35</td><td></td><td>5 + 35 = 40</td><td></td><td>44 - 6 = 38</td><td></td></tr> <tr><td>30 - 9 = 21</td><td></td><td>34 + 4 = 38</td><td></td><td>37 - 6 = 31</td><td></td><td>13 + 3 = 21</td><td></td></tr> <tr><td>15 + 8 = 23</td><td></td><td>23 - 4 = 19</td><td></td><td>17 + 6 = 23</td><td></td><td>36 - 5 = 31</td><td></td></tr> <tr><td>23 - 6 = 17</td><td></td><td>9 + 19 = 28</td><td></td><td>48 - 9 = 39</td><td></td><td>12 + 9 = 21</td><td></td></tr> <tr><td>4 + 25 = 29</td><td></td><td>29 - 6 = 23</td><td></td><td>3 + 23 = 26</td><td></td><td>41 - 8 = 33</td><td></td></tr> <tr><td>32 - 6 = 26</td><td></td><td>9 + 13 = 22</td><td></td><td>44 - 8 = 36</td><td></td><td>7 + 17 = 24</td><td></td></tr> <tr><td>14 + 7 = 21</td><td></td><td>38 - 9 = 29</td><td></td><td>6 + 18 = 24</td><td></td><td>31 - 6 = 25</td><td></td></tr> <tr><td>13 - 2 = 16</td><td></td><td>23 + 7 = 30</td><td></td><td>28 - 3 = 25</td><td></td><td>29 + 9 = 38</td><td></td></tr> </tbody> </table>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	8 + 18 = 26		21 - 7 = 14		8 + 16 = 24		24 - 2 = 22		25 - 6 = 19		13 + 4 = 17		36 - 8 = 28		8 + 17 = 25		9 + 14 = 23		29 - 8 = 21		7 + 31 = 38		25 - 7 = 18		23 - 2 = 21		28 + 2 = 30		32 - 5 = 27		2 + 37 = 39		31 + 3 = 34		21 - 9 = 12		19 + 7 = 26		22 - 3 = 19		25 - 2 = 23		4 + 18 = 22		30 - 6 = 24		16 + 6 = 22		7 + 15 = 22		32 - 8 = 24		15 + 6 = 21		37 - 2 = 35		26 - 7 = 19		44 + 1 = 45		24 - 7 = 17		19 + 6 = 25		2 + 24 = 26		43 - 8 = 35		5 + 35 = 40		44 - 6 = 38		30 - 9 = 21		34 + 4 = 38		37 - 6 = 31		13 + 3 = 21		15 + 8 = 23		23 - 4 = 19		17 + 6 = 23		36 - 5 = 31		23 - 6 = 17		9 + 19 = 28		48 - 9 = 39		12 + 9 = 21		4 + 25 = 29		29 - 6 = 23		3 + 23 = 26		41 - 8 = 33		32 - 6 = 26		9 + 13 = 22		44 - 8 = 36		7 + 17 = 24		14 + 7 = 21		38 - 9 = 29		6 + 18 = 24		31 - 6 = 25		13 - 2 = 16		23 + 7 = 30		28 - 3 = 25		29 + 9 = 38		yes / no
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5	<p>4x, 6x, 7x, 8x & 9x multiplication and division facts.</p> <p>Ask these facts one of several ways, as ...</p> <p>"What does 4 multiplied by 9 equal?"</p> <p>"What does 36 divided by 4 equal?"</p> <p>"What number multiplied by 4 gives you an answer of 36?"</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> </tr> </thead> <tbody> <tr><td>10 x 6 = 60</td><td></td><td>4 x 9 = 36</td><td></td><td>5 x 8 = 40</td><td></td><td>7 x 7 = 49</td><td></td></tr> <tr><td>16 ÷ 8 = 2</td><td></td><td>21 ÷ 7 = 3</td><td></td><td>54 ÷ 6 = 9</td><td></td><td>12 ÷ 4 = 3</td><td></td></tr> <tr><td>7 x 8 = 56</td><td></td><td>3 x 6 = 18</td><td></td><td>4 x 7 = 28</td><td></td><td>8 x 9 = 72</td><td></td></tr> <tr><td>24 ÷ 4 = 6</td><td></td><td>81 ÷ 9 = 9</td><td></td><td>70 ÷ 7 = 10</td><td></td><td>40 ÷ 4 = 10</td><td></td></tr> <tr><td>8 x 8 = 64</td><td></td><td>7 x 5 = 35</td><td></td><td>8 x 6 = 48</td><td></td><td>4 x 4 = 16</td><td></td></tr> <tr><td>30 ÷ 6 = 5</td><td></td><td>32 ÷ 4 = 8</td><td></td><td>24 ÷ 8 = 3</td><td></td><td>14 ÷ 7 = 2</td><td></td></tr> <tr><td>9 x 3 = 27</td><td></td><td>2 x 8 = 16</td><td></td><td>7 x 3 = 21</td><td></td><td>9 x 6 = 54</td><td></td></tr> <tr><td>63 ÷ 7 = 9</td><td></td><td>42 ÷ 6 = 7</td><td></td><td>20 ÷ 4 = 6</td><td></td><td>36 ÷ 6 = 6</td><td></td></tr> <tr><td>10 x 4 = 40</td><td></td><td>4 x 6 = 24</td><td></td><td>10 x 8 = 80</td><td></td><td>7 x 10 = 70</td><td></td></tr> <tr><td>54 ÷ 9 = 6</td><td></td><td>40 ÷ 8 = 5</td><td></td><td>72 ÷ 9 = 8</td><td></td><td>60 ÷ 6 = 10</td><td></td></tr> <tr><td>7 x 2 = 14</td><td></td><td>5 x 6 = 30</td><td></td><td>4 x 8 = 32</td><td></td><td>3 x 8 = 24</td><td></td></tr> <tr><td>18 ÷ 6 = 3</td><td></td><td>28 ÷ 4 = 7</td><td></td><td>80 ÷ 8 = 10</td><td></td><td>56 ÷ 7 = 8</td><td></td></tr> <tr><td>6 x 6 = 36</td><td></td><td>7 x 9 = 63</td><td></td><td>7 x 6 = 42</td><td></td><td>4 x 5 = 20</td><td></td></tr> <tr><td>35 ÷ 7 = 5</td><td></td><td>48 ÷ 6 = 8</td><td></td><td>16 ÷ 4 = 4</td><td></td><td>64 ÷ 8 = 8</td><td></td></tr> <tr><td>4 x 3 = 12</td><td></td><td>2 x 9 = 18</td><td></td><td>9 x 5 = 45</td><td></td><td>4 x 9 = 36</td><td></td></tr> <tr><td>36 ÷ 4 = 9</td><td></td><td>72 ÷ 8 = 9</td><td></td><td>49 ÷ 7 = 7</td><td></td><td>63 ÷ 9 = 7</td><td></td></tr> </tbody> </table>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	10 x 6 = 60		4 x 9 = 36		5 x 8 = 40		7 x 7 = 49		16 ÷ 8 = 2		21 ÷ 7 = 3		54 ÷ 6 = 9		12 ÷ 4 = 3		7 x 8 = 56		3 x 6 = 18		4 x 7 = 28		8 x 9 = 72		24 ÷ 4 = 6		81 ÷ 9 = 9		70 ÷ 7 = 10		40 ÷ 4 = 10		8 x 8 = 64		7 x 5 = 35		8 x 6 = 48		4 x 4 = 16		30 ÷ 6 = 5		32 ÷ 4 = 8		24 ÷ 8 = 3		14 ÷ 7 = 2		9 x 3 = 27		2 x 8 = 16		7 x 3 = 21		9 x 6 = 54		63 ÷ 7 = 9		42 ÷ 6 = 7		20 ÷ 4 = 6		36 ÷ 6 = 6		10 x 4 = 40		4 x 6 = 24		10 x 8 = 80		7 x 10 = 70		54 ÷ 9 = 6		40 ÷ 8 = 5		72 ÷ 9 = 8		60 ÷ 6 = 10		7 x 2 = 14		5 x 6 = 30		4 x 8 = 32		3 x 8 = 24		18 ÷ 6 = 3		28 ÷ 4 = 7		80 ÷ 8 = 10		56 ÷ 7 = 8		6 x 6 = 36		7 x 9 = 63		7 x 6 = 42		4 x 5 = 20		35 ÷ 7 = 5		48 ÷ 6 = 8		16 ÷ 4 = 4		64 ÷ 8 = 8		4 x 3 = 12		2 x 9 = 18		9 x 5 = 45		4 x 9 = 36		36 ÷ 4 = 9		72 ÷ 8 = 9		49 ÷ 7 = 7		63 ÷ 9 = 7		yes / no
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(1) Solve these equations.

$4d + 13 = 49$ $d =$ _____

$7k - 19 = 37$ $k =$ _____

(2) Round these numbers to the nearest 10.

$362 =$ _____ $257 =$ _____

$1846 =$ _____ $2395 =$ _____

(3) Find the square of these numbers.

$7^2 =$ _____ $9^2 =$ _____

$12^2 =$ _____ $20^2 =$ _____

(4) Convert these percentages to decimals.

$25\% =$ _____ $30\% =$ _____ $97\% =$ _____

$124\% =$ _____ $4\% =$ _____ $0.5\% =$ _____

(5) Adding decimals. 9.5

$56.84 + 530.23 + 9.7 =$ _____ 4133.5

$274.19 + 6.2 + 93.58 =$ _____ 71.5

$8.7 + 39.6 + 624.1 =$ _____ + 621.1

(6) Subtracting decimals.

$148.45 - 5.27 =$ _____ 148.83

$64.782 - 1.36 =$ _____ - 75.96

$931.0 - 463.23 =$ _____

(7) Multiplying large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$593 \times 8 = ($ _____ \times _____ $) - ($ _____ \times _____ $)$

$=$ _____ $=$ _____

(8) Dividing decimals.

$4 \overline{) 292}$

$7 \overline{) 37.03}$

$9 \overline{) 72.9}$

$8 \overline{) 383.2}$

(1) Write these numbers in order from smallest to largest.



3.28

0.329

32.4

0.0329

326

_____, _____, _____

(2) What is the place value of the BOLD digit and what does it mean?

$4.1**3** =$ _____ $=$ _____ $6.**2**7 =$ _____ $=$ _____

$13.**4**8 =$ _____ $=$ _____ $31.**9**4 =$ _____ $=$ _____

(3) Convert these percentages to fractions.

$40\% =$ _____ $66\frac{2}{3}\% =$ _____ $5\% =$ _____

$17\% =$ _____ $75\% =$ _____ $125\% =$ _____

(4) Round these numbers to the nearest 100.

$632 =$ _____ $850 =$ _____

$1794 =$ _____ $1469 =$ _____

(5) Adding decimals. 331.8

$13.6 + 324.2 + 7.65 =$ _____ 52.7

$142.7 +$ _____ $+ 4.55 = 157.67$ 5120.9

$9.39 + 46.8 +$ _____ $= 302.54$ + 47.9

(6) Subtracting decimals.

$259.34 -$ _____ $= 187.84$ 397.13

_____ $- 21.53 = 436.27$ -

$1788.3 -$ _____ $= 162.87$ 342.49

(7) Multiplying decimals. 74.1

67.3 3.90 _____ $\times 6.9$

$\times 5$ $\times 8$ _____

(8) Dividing large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$665 \div 7 = ($ _____ \div _____ $) - ($ _____ \div _____ $)$

$=$ _____ $-$ _____ $=$ _____

(1) Skip counting in 9's, write the number that comes after ...



81, _____ 45, _____ 108, _____

(2) Round these numbers to the nearest 10 or 100 and then work out an estimated answer.

$78 + 194 + 34 = \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

$6345 - 287 = \underline{\quad} - \underline{\quad} = \underline{\quad}$

(3) Find each fraction of these decimals.

$\frac{1}{7}$ of 5.6 = _____ $\frac{2}{5}$ of 23.5 = _____

$\frac{2}{3}$ of 12.9 = _____ $\frac{7}{8}$ of 25.6 = _____

(4) Convert these decimals to percentages.

0.25 = _____ 0.9 = _____ 0.65 = _____

0.004 = _____ 0.08 = _____ 2.75 = _____

(5) Adding large numbers. 5852

$1943 + 32 + 751 = \underline{\quad}$ 770

$847 + 5390 + 29 = \underline{\quad}$ 36
+ 519

$89 + 302 + 6731 = \underline{\quad}$

(6) Subtracting large numbers.

$4620 - 673 = \underline{\quad}$ 27000

$7208 - 618 = \underline{\quad}$ - 579

$12393 - 739 = \underline{\quad}$

(7) Multiplying large numbers using place value.

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$

$276 \times 9 = (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$

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

(8) Dividing large numbers with remainders.

$3 \overline{) 427}$

$6 \overline{) 2398}$

$5 \overline{) 684}$

$8 \overline{) 9207}$

(1) Order of operations.

BEDMAS

$9 + 32 \div 4 = \underline{\quad}$ $82 - 7 \times 9 = \underline{\quad}$

$2 \times 7 + 3^2 = \underline{\quad}$ $3(8 + 4 \times 3) = \underline{\quad}$

(2) Round these numbers to the nearest 1000.

2530 = _____ 9190 = _____

12499 = _____ 23710 = _____

(3) Find the percentage of these numbers.

50% of 84 = _____ 25% of 52 = _____

10% of 96 = _____ 40% of 70 = _____

(4) Find the square root of these numbers.

Example: $\sqrt{9} = 3$ as $3 \times 3 = 9$

$\sqrt{25} = \underline{\quad}$ $\sqrt{49} = \underline{\quad}$

$\sqrt{121} = \underline{\quad}$ $\sqrt{400} = \underline{\quad}$

(5) Adding large numbers. 851

$45 + 3421 + 284 = \underline{\quad}$ 4653

$1893 + \underline{\quad} + 76 = 2127$ 72
+ 913

$283 + 54 + \underline{\quad} = 3162$

(6) Subtracting large numbers.

$6892 - \underline{\quad} = 2032$ 6347

$\underline{\quad} - 853 = 9144$ -

$7336 - \underline{\quad} = 2389$ 1422

(7) Multiplying whole numbers. 806

$982 \quad 745 \quad \underline{\quad} \times 37$

$\times 4 \quad \times 6 \quad \underline{\quad}$

(8) Dividing large numbers using multiples of 10.

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$

$963 \div 9 = (\underline{\quad} \div \underline{\quad}) + (\underline{\quad} \div \underline{\quad})$

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

(1) Skip counting in 8's, write the number that comes before ...
 _____, 48 _____, 120 _____, 88



(2) What is the place value of the BOLD digit and what does it mean?
 2**9**.34 = _____ = _____ **3**59 = _____ = _____
 7.**9**5 = _____ = _____ 6.**7**2 = _____ = _____

(3) Find the percentage of these decimals.
 33 $\frac{1}{3}$ % of 12.6 = _____ 20% of 9.5 = _____
 25% of 0.48 = _____ 80% of 20.5 = _____

(4) Convert these decimals to fractions.
 0.6 = _____ 0.17 = _____ 0.33 = _____
 0.08 = _____ 3.75 = _____ 0.005 = _____

(5) Adding decimals. 53.31
 7.9 + 65.48 + 305.32 = _____ 5.90
 39.85 + 247.91 + 2.6 = _____ 533.14
 142.6 + 7.8 + 69.3 = _____ + 12.16

(6) Subtracting decimals.
 548.41 - 9.25 = _____ 3884.1
 82.746 - 6.31 = _____ - 695.7
 785.00 - 323.64 = _____

(7) Multiplying large numbers using 'tidy' numbers.
 Example: $304 \times 3 = (300 \times 3) + (4 \times 3) = 900 + 12 = 912$
 $709 \times 6 = (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$
 = _____ + _____ = _____


(8) Dividing decimals.
 $4 \overline{) 3.44}$ $7 \overline{) 24.22}$
 $5 \overline{) 78.5}$ $9 \overline{) 6.048}$

(1) Round these numbers to the nearest 10 or 100 and then work out an estimated answer.
 $256 + 107 + 86 = \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$
 $6810 - 516 = \underline{\quad} - \underline{\quad} = \underline{\quad}$

(2) Multiplying by 10, 100 or 1000.
 $56 \times 10 = \underline{\quad}$ $2.34 \times 1000 = \underline{\quad}$
 $0.34 \times 1000 = \underline{\quad}$ $136 \times 100 = \underline{\quad}$

(3) Convert these improper fractions to mixed numbers. Example: $\frac{11}{4} = 2\frac{3}{4}$
 $\frac{19}{5} = \underline{\quad}$ $\frac{37}{8} = \underline{\quad}$
 $\frac{27}{6} = \underline{\quad}$ $\frac{48}{9} = \underline{\quad}$




(4) A group of 6 pupils from Room 8 went on a bus ride to the zoo. If this group makes up $\frac{1}{5}$ of the Room 8 pupils, how many pupils are there in Room 8?


(5) Adding decimals. 31.8
 $316 + 342.2 + 6.75 = \underline{\quad}$ 5152.7
 $417.2 + \underline{\quad} + 5.45 = 721.76$ 7.5
 $3.93 + 64.8 + \underline{\quad} = 203.45$ + 347.9

(6) Subtracting decimals.
 $925.43 - \underline{\quad} = 781.48$ 739.13
 $\underline{\quad} - 35.12 = 634.92$ -
 $1298.3 - \underline{\quad} = 526.78$ 234.49

(7) Multiplying decimals. 5.74
 6.78 43.6 $\underline{\quad} \times 9.2$
 $\times 5$ $\times 8$

(8) Dividing large numbers using 'tidy' numbers.
 Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$
 $873 \div 9 = (\underline{\quad} \div \underline{\quad}) - (\underline{\quad} \div \underline{\quad})$
 = _____ - _____ = _____


(1) Skip counting in 9's, write the number that is between ... 

36 ____ 54, 72 ____ 90, 108 ____ 126

(2) Round these numbers to the nearest 10th.

60.92 = ____ 5.374 = ____

9.765 = ____ 78.049 = ____

(3) Solve these equations, with mixed number answers. 

$7d + 21 = 32$ $d =$ ____

$8k - 14 = 59$ $k =$ ____

(4) Convert these fractions to decimals.

$\frac{1}{2} =$ ____ $\frac{2}{5} =$ ____ $\frac{2}{3} =$ ____

$\frac{3}{4} =$ ____ $\frac{7}{10} =$ ____ $\frac{3}{100} =$ ____

(5) Adding large numbers. 3418

9304 + 406 + 83 = ____ 28

494 + 54 + 2387 = ____ 52910

59 + 4186 + 943 = ____ + 384

(6) Subtracting large numbers.

3162 - 294 = ____ 23895

57827 - 8584 = ____ - 728

29862 - 439 = ____

(7) Multiplying large numbers using place value. *Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$*


$409 \times 8 = ($ ____ \times ____ $) + ($ ____ \times ____ $) + ($ ____ \times ____ $)$

= ____ + ____ + ____ = ____

(8) Dividing large numbers with remainders.

$6 \overline{) 592}$ $7 \overline{) 2393}$

$4 \overline{) 791}$ $9 \overline{) 4607}$

(1) Write these number words as decimal numerals. 

one hundred point two zero eight ____

sixty-seven point zero zero nine five ____


(2) Write two equivalent fractions.

$\frac{3}{5} = \frac{2}{7} =$ ____

(3) Round these numbers to the nearest 100th.

0.056 = ____ 3.961 = ____

45.009 = ____ 2.3419 = ____

(4) Complete these ratios. 

Example: The ratio 3:4 is the same as 6:8.

2:3 = ____ :12 5: ____ = 20:16

____ :32 = 1:8 24:18 = 4: ____

(5) Adding large numbers. 6581

5936 + 589 + ____ = 6597 35

2475 + ____ + 769 = 6045 47207

54 + 2394 + ____ = 3213 + 398

(6) Subtracting large numbers.

1473 - ____ = 719 18835

____ - 6438 = 50936 -

26417 - ____ = 21857 9379

(7) Multiplying whole numbers. 6051

238 517 ____

$\times 8$ $\times 9$ $\times 27$

(8) Dividing large numbers using multiples of 10. *Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$*

$424 \div 8 = ($ ____ \div ____ $) + ($ ____ \div ____ $)$

= ____ + ____ = ____

(1) Skip counting in 9's, write the number that comes after ...



81, _____ 45, _____ 108, _____

(2) Round these numbers to the nearest 10th and then work out an estimated answer.

$40.29 + 8.73 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

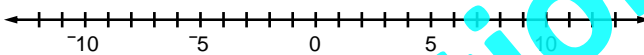
$32.54 - 7.25 = \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(3) Dividing by 10, 100 or 1000.

$265 \div 10 = \underline{\hspace{2cm}}$ $736 \div 100 = \underline{\hspace{2cm}}$

$3.48 \div 100 = \underline{\hspace{2cm}}$ $412 \div 1000 = \underline{\hspace{2cm}}$

(4) Add these positive and negative numbers



$-9 + 8 = \underline{\hspace{2cm}}$ $-7 + 12 = \underline{\hspace{2cm}}$

$8 + -11 = \underline{\hspace{2cm}}$ $-1 + -3 = \underline{\hspace{2cm}}$



(5) Adding decimals. 462.52

$144.3 + 7.32 + 1.3 = \underline{\hspace{2cm}}$ 0.63

$4.71 + 26 + 853.4 = \underline{\hspace{2cm}}$ 3109.36

$7.2 + 94.4 + 4.124 = \underline{\hspace{2cm}}$ + 45.12

(6) Subtracting decimals.

$129.8 - 5.3 = \underline{\hspace{2cm}}$ 564.7

$134.27 - 96.5 = \underline{\hspace{2cm}}$ - 48.2

$2738.5 - 36.21 = \underline{\hspace{2cm}}$

(7) Multiplying large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$855 \times 9 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) - (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$

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

(8) Dividing decimals with remainders.

$5 \overline{) 6.48}$

$6 \overline{) 96.14}$

$3 \overline{) 87.5}$

$8 \overline{) 7.493}$

(1) Write these decimals as number words.

1.023 _____

40.961 _____

(2) What is the place value of the BOLD digit and what does it mean

$1.7**6** = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$ $5**7**.28 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$151.9 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$ $1**9**.34 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(3) Convert these mixed numbers to improper fractions. *Example: $4\frac{2}{3} = \frac{14}{3}$*

$3\frac{7}{8} = \underline{\hspace{2cm}}$ $4\frac{4}{9} = \underline{\hspace{2cm}}$

$5\frac{4}{5} = \underline{\hspace{2cm}}$ $6\frac{2}{11} = \underline{\hspace{2cm}}$



(4) Convert these fractions to percentages.

$\frac{1}{4} = \underline{\hspace{2cm}}$ $\frac{1}{3} = \underline{\hspace{2cm}}$ $\frac{4}{5} = \underline{\hspace{2cm}}$

$\frac{7}{8} = \underline{\hspace{2cm}}$ $\frac{1}{20} = \underline{\hspace{2cm}}$ $\frac{3}{100} = \underline{\hspace{2cm}}$

(5) Adding decimals. 167.5

$46.2 + 41 + \underline{\hspace{2cm}} = 89.983$ 8.1

$5.53 + \underline{\hspace{2cm}} + 47 = 314.2$ 3252.3

$41 + 9.27 + \underline{\hspace{2cm}} = 176.0$ + 42.6

(6) Subtracting decimals.

$32.86 - \underline{\hspace{2cm}} = 2.516$ 155.39

$\underline{\hspace{2cm}} - 26.08 = 97.4$ -

$2157.3 - \underline{\hspace{2cm}} = 19.706$ 63.51

(7) Multiplying decimals. 0.589

4.89 23.7 x 4.8

$\times 0.5$ $\times 0.06$ _____

(8) Dividing large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$232 \div 8 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) - (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$

$= \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Number Knowledge Progress Assessment 2

Practical / oral assessment: **Ask** each question as outlined below. **Record** the results by circling yes or no

	Practical / Oral Questions (Supply your child with some paper)	Result (circle)																																																																																																																																								
1	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to recite a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																																																								
2	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to write a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																																																								
3	Write up to 10 2, 3, 4 or 5 digit numbers and ask your child to round each number to the nearest 10, 100 or 1000 .	yes / no																																																																																																																																								
4	<p>Addition and subtraction numeracy facts.</p> <p>Tick each correct answer.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> </tr> </thead> <tbody> <tr><td>2 + 24 = 26</td><td></td><td>24 - 2 = 22</td><td></td><td>5 + 35 = 40</td><td></td><td>43 - 8 = 35</td><td></td></tr> <tr><td>30 - 9 = 21</td><td></td><td>8 + 17 = 25</td><td></td><td>37 - 6 = 31</td><td></td><td>34 + 4 = 38</td><td></td></tr> <tr><td>15 + 8 = 23</td><td></td><td>25 - 7 = 18</td><td></td><td>17 + 6 = 23</td><td></td><td>23 - 4 = 19</td><td></td></tr> <tr><td>23 - 6 = 17</td><td></td><td>2 + 37 = 39</td><td></td><td>43 - 9 = 39</td><td></td><td>9 + 39 = 48</td><td></td></tr> <tr><td>4 + 25 = 29</td><td></td><td>22 - 3 = 19</td><td></td><td>3 + 23 = 26</td><td></td><td>29 - 6 = 23</td><td></td></tr> <tr><td>32 - 6 = 26</td><td></td><td>16 + 6 = 22</td><td></td><td>44 - 8 = 36</td><td></td><td>9 - 13 = 22</td><td></td></tr> <tr><td>14 + 7 = 21</td><td></td><td>37 - 2 = 35</td><td></td><td>6 + 18 = 24</td><td></td><td>38 - 9 = 29</td><td></td></tr> <tr><td>18 - 2 = 16</td><td></td><td>19 + 6 = 25</td><td></td><td>28 - 3 = 25</td><td></td><td>23 + 7 = 30</td><td></td></tr> <tr><td>8 + 16 = 24</td><td></td><td>21 - 7 = 14</td><td></td><td>6 + 18 = 26</td><td></td><td>44 - 6 = 38</td><td></td></tr> <tr><td>36 - 8 = 28</td><td></td><td>13 + 4 = 17</td><td></td><td>25 - 6 = 19</td><td></td><td>13 + 3 = 21</td><td></td></tr> <tr><td>7 + 31 = 38</td><td></td><td>29 - 8 = 21</td><td></td><td>9 + 14 = 23</td><td></td><td>36 - 5 = 31</td><td></td></tr> <tr><td>32 - 5 = 27</td><td></td><td>28 - 2 = 30</td><td></td><td>23 - 2 = 21</td><td></td><td>12 + 9 = 21</td><td></td></tr> <tr><td>19 + 7 = 26</td><td></td><td>21 - 9 = 12</td><td></td><td>31 + 3 = 34</td><td></td><td>41 - 8 = 33</td><td></td></tr> <tr><td>30 - 6 = 24</td><td></td><td>4 + 18 = 22</td><td></td><td>25 - 2 = 23</td><td></td><td>7 + 17 = 24</td><td></td></tr> <tr><td>15 + 6 = 21</td><td></td><td>32 - 8 = 24</td><td></td><td>7 + 15 = 22</td><td></td><td>31 - 6 = 25</td><td></td></tr> <tr><td>21 - 7 = 17</td><td></td><td>44 + 1 = 45</td><td></td><td>26 - 7 = 19</td><td></td><td>19 + 9 = 28</td><td></td></tr> </tbody> </table>		✓		✓		✓		✓	2 + 24 = 26		24 - 2 = 22		5 + 35 = 40		43 - 8 = 35		30 - 9 = 21		8 + 17 = 25		37 - 6 = 31		34 + 4 = 38		15 + 8 = 23		25 - 7 = 18		17 + 6 = 23		23 - 4 = 19		23 - 6 = 17		2 + 37 = 39		43 - 9 = 39		9 + 39 = 48		4 + 25 = 29		22 - 3 = 19		3 + 23 = 26		29 - 6 = 23		32 - 6 = 26		16 + 6 = 22		44 - 8 = 36		9 - 13 = 22		14 + 7 = 21		37 - 2 = 35		6 + 18 = 24		38 - 9 = 29		18 - 2 = 16		19 + 6 = 25		28 - 3 = 25		23 + 7 = 30		8 + 16 = 24		21 - 7 = 14		6 + 18 = 26		44 - 6 = 38		36 - 8 = 28		13 + 4 = 17		25 - 6 = 19		13 + 3 = 21		7 + 31 = 38		29 - 8 = 21		9 + 14 = 23		36 - 5 = 31		32 - 5 = 27		28 - 2 = 30		23 - 2 = 21		12 + 9 = 21		19 + 7 = 26		21 - 9 = 12		31 + 3 = 34		41 - 8 = 33		30 - 6 = 24		4 + 18 = 22		25 - 2 = 23		7 + 17 = 24		15 + 6 = 21		32 - 8 = 24		7 + 15 = 22		31 - 6 = 25		21 - 7 = 17		44 + 1 = 45		26 - 7 = 19		19 + 9 = 28		yes / no
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5	<p>4x, 6x, 7x, 8x & 9x multiplication and division facts.</p> <p>Ask these facts one of several ways, as ...</p> <p>"What does 4 multiplied by 9 equal?"</p> <p>"What does 36 divided by 4 equal?"</p> <p>"What number multiplied by 4 gives you an answer of 36?"</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> <th style="width: 25%;"></th> <th style="width: 5%;">✓</th> </tr> </thead> <tbody> <tr><td>54 ÷ 9 = 6</td><td></td><td>40 ÷ 8 = 5</td><td></td><td>81 ÷ 9 = 9</td><td></td></tr> <tr><td>7 x 2 = 14</td><td></td><td>5 x 6 = 30</td><td></td><td>4 x 8 = 32</td><td></td></tr> <tr><td>18 ÷ 6 = 3</td><td></td><td>28 ÷ 4 = 7</td><td></td><td>72 ÷ 8 = 9</td><td></td></tr> <tr><td>6 x 6 = 36</td><td></td><td>7 x 9 = 63</td><td></td><td>7 x 6 = 42</td><td></td></tr> <tr><td>35 ÷ 7 = 5</td><td></td><td>48 ÷ 6 = 8</td><td></td><td>16 ÷ 4 = 4</td><td></td></tr> <tr><td>4 x 3 = 12</td><td></td><td>2 x 9 = 18</td><td></td><td>9 x 5 = 45</td><td></td></tr> <tr><td>36 ÷ 4 = 9</td><td></td><td>80 ÷ 8 = 10</td><td></td><td>49 ÷ 7 = 7</td><td></td></tr> <tr><td>10 x 6 = 60</td><td></td><td>4 x 9 = 36</td><td></td><td>5 x 8 = 40</td><td></td></tr> <tr><td>16 ÷ 8 = 2</td><td></td><td>21 ÷ 7 = 3</td><td></td><td>54 ÷ 6 = 9</td><td></td></tr> <tr><td>7 x 8 = 56</td><td></td><td>3 x 6 = 18</td><td></td><td>4 x 7 = 28</td><td></td></tr> <tr><td>24 ÷ 4 = 6</td><td></td><td>72 ÷ 9 = 8</td><td></td><td>70 ÷ 7 = 10</td><td></td></tr> <tr><td>8 x 8 = 64</td><td></td><td>7 x 5 = 35</td><td></td><td>8 x 6 = 48</td><td></td></tr> <tr><td>30 ÷ 6 = 5</td><td></td><td>32 ÷ 4 = 8</td><td></td><td>24 ÷ 8 = 3</td><td></td></tr> <tr><td>9 x 3 = 27</td><td></td><td>2 x 8 = 16</td><td></td><td>7 x 3 = 21</td><td></td></tr> <tr><td>63 ÷ 7 = 9</td><td></td><td>42 ÷ 6 = 7</td><td></td><td>20 ÷ 4 = 6</td><td></td></tr> <tr><td>10 x 4 = 40</td><td></td><td>4 x 6 = 24</td><td></td><td>10 x 8 = 80</td><td></td></tr> </tbody> </table>		✓		✓		✓	54 ÷ 9 = 6		40 ÷ 8 = 5		81 ÷ 9 = 9		7 x 2 = 14		5 x 6 = 30		4 x 8 = 32		18 ÷ 6 = 3		28 ÷ 4 = 7		72 ÷ 8 = 9		6 x 6 = 36		7 x 9 = 63		7 x 6 = 42		35 ÷ 7 = 5		48 ÷ 6 = 8		16 ÷ 4 = 4		4 x 3 = 12		2 x 9 = 18		9 x 5 = 45		36 ÷ 4 = 9		80 ÷ 8 = 10		49 ÷ 7 = 7		10 x 6 = 60		4 x 9 = 36		5 x 8 = 40		16 ÷ 8 = 2		21 ÷ 7 = 3		54 ÷ 6 = 9		7 x 8 = 56		3 x 6 = 18		4 x 7 = 28		24 ÷ 4 = 6		72 ÷ 9 = 8		70 ÷ 7 = 10		8 x 8 = 64		7 x 5 = 35		8 x 6 = 48		30 ÷ 6 = 5		32 ÷ 4 = 8		24 ÷ 8 = 3		9 x 3 = 27		2 x 8 = 16		7 x 3 = 21		63 ÷ 7 = 9		42 ÷ 6 = 7		20 ÷ 4 = 6		10 x 4 = 40		4 x 6 = 24		10 x 8 = 80		yes / no																																		
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24 ÷ 4 = 6		72 ÷ 9 = 8		70 ÷ 7 = 10																																																																																																																																						
8 x 8 = 64		7 x 5 = 35		8 x 6 = 48																																																																																																																																						
30 ÷ 6 = 5		32 ÷ 4 = 8		24 ÷ 8 = 3																																																																																																																																						
9 x 3 = 27		2 x 8 = 16		7 x 3 = 21																																																																																																																																						
63 ÷ 7 = 9		42 ÷ 6 = 7		20 ÷ 4 = 6																																																																																																																																						
10 x 4 = 40		4 x 6 = 24		10 x 8 = 80																																																																																																																																						

- (1)
- Multiplying by 10, 100 or 1000.**

$562 \times 10 = \underline{\hspace{2cm}} \quad 1.2 \times 1000 = \underline{\hspace{2cm}}$

$3.4 \times 1000 = \underline{\hspace{2cm}} \quad 0.79 \times 100 = \underline{\hspace{2cm}}$

- (2)
- Round these numbers to the nearest 10 or 100 and then work out an estimated answer.**

$231 + 89 + 412 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

$6539 - 795 = \underline{\hspace{1cm}} - \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

- (3)
- Find the square root of these numbers.**

$\sqrt{144} = \underline{\hspace{2cm}} \quad \sqrt{81} = \underline{\hspace{2cm}}$

$\sqrt{225} = \underline{\hspace{2cm}} \quad \sqrt{400} = \underline{\hspace{2cm}}$

- (4)
- Convert these percentages to decimals.**

$70\% = \underline{\hspace{2cm}} \quad 39\% = \underline{\hspace{2cm}} \quad 0.9\% = \underline{\hspace{2cm}}$

$420\% = \underline{\hspace{2cm}} \quad 8\% = \underline{\hspace{2cm}} \quad 66\% = \underline{\hspace{2cm}}$

- (5)
- Adding large numbers.**
- 315

$9309 + 63 + 808 = \underline{\hspace{2cm}} \quad \begin{array}{r} 36825 \\ 457 \\ + 1780 \\ \hline \end{array}$

$2631 + 38274 + 699 = \underline{\hspace{2cm}}$

$5205 + 678 + 14267 = \underline{\hspace{2cm}}$

- (6)
- Subtracting large numbers.**

$3578 - \underline{\hspace{2cm}} = 2849 \quad \begin{array}{r} 12385 \\ - \\ \hline \end{array}$

$\underline{\hspace{2cm}} - 4872 = 27967 \quad \begin{array}{r} - \\ \hline \end{array}$

$29167 - \underline{\hspace{2cm}} = 256691 \quad \begin{array}{r} 6789 \\ - \\ \hline \end{array}$

- (7)
- Multiplying whole numbers.**
- 1673

$\begin{array}{r} 4108 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 2945 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} \\ \times 39 \\ \hline \end{array}$

- (8)
- Dividing large numbers with remainders.**

$\begin{array}{r} \\ 7 \overline{) 955} \\ \hline \end{array}$

$\begin{array}{r} \\ 5 \overline{) 6581} \\ \hline \end{array}$

$\begin{array}{r} \\ 4 \overline{) 719} \\ \hline \end{array}$

$\begin{array}{r} \\ 9 \overline{) 7068} \\ \hline \end{array}$

- (1)
- Order of operations.**

$15 + 6 \times 9 = \underline{\hspace{2cm}} \quad 91 - 60 \div 15 = \underline{\hspace{2cm}}$

$72 \div 8 + 7^2 = \underline{\hspace{2cm}} \quad 5(31 - 3 \times 8) = \underline{\hspace{2cm}}$

- (2)
- Find the square or powers of these numbers.**

$5^2 = \underline{\hspace{2cm}} \quad 11^2 = \underline{\hspace{2cm}}$

$10^3 = \underline{\hspace{2cm}} \quad 3^4 = \underline{\hspace{2cm}}$

- (3)
- Convert these percentages to fractions.**

$33\frac{1}{3}\% = \underline{\hspace{2cm}} \quad 80\% = \underline{\hspace{2cm}} \quad 75\% = \underline{\hspace{2cm}}$

$4\% = \underline{\hspace{2cm}} \quad 150\% = \underline{\hspace{2cm}} \quad 43\% = \underline{\hspace{2cm}}$

- (4)
- Round these numbers to 1 decimal place.**

$3.94 = \underline{\hspace{2cm}} \quad 9.06 = \underline{\hspace{2cm}}$

$21.45 = \underline{\hspace{2cm}} \quad 6.128 = \underline{\hspace{2cm}}$

- (5)
- Adding large numbers.**
- 2571

$734 + 68 + 2412 = \underline{\hspace{2cm}} \quad \begin{array}{r} 83 \\ 31426 \\ + 625 \\ \hline \end{array}$

$547 + \underline{\hspace{2cm}} + 35 = 3412$

$71 + 942 + \underline{\hspace{2cm}} = 1670$

- (6)
- Subtracting large numbers.**

$3084 - 447 = \underline{\hspace{2cm}} \quad \begin{array}{r} 54806 \\ - 7385 \\ \hline \end{array}$

$45780 - 7372 = \underline{\hspace{2cm}}$

$156273 - 5348 = \underline{\hspace{2cm}}$

- (7)
- Multiplying large numbers using place value.**

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$

$453 \times 7 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$

$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

- (8)
- Dividing large numbers using multiples of 10.**

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$

$927 \div 9 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$

$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

- (1) **Dividing by 10, 100 or 1000.**
 $245 \div 10 = \underline{\hspace{2cm}}$ $5.76 \div 100 = \underline{\hspace{2cm}}$
 $89.34 \div 100 = \underline{\hspace{2cm}}$ $1047 \div 1000 = \underline{\hspace{2cm}}$
- (2) **Find each fraction of these decimals.**
 $\frac{1}{3}$ of 14.4 = $\underline{\hspace{2cm}}$ $\frac{2}{5}$ of 6.5 = $\underline{\hspace{2cm}}$
 $\frac{3}{7}$ of 6.3 = $\underline{\hspace{2cm}}$ $\frac{4}{9}$ of 0.72 = $\underline{\hspace{2cm}}$
- (3) **Round these numbers to 1 significant figure.**
 2350 = $\underline{\hspace{2cm}}$ 69000 = $\underline{\hspace{2cm}}$
 0.021 = $\underline{\hspace{2cm}}$ 0.0048 = $\underline{\hspace{2cm}}$
- (4) **Convert these decimals to percentages.**
 0.23 = $\underline{\hspace{2cm}}$ 0.66 = $\underline{\hspace{2cm}}$ 0.08 = $\underline{\hspace{2cm}}$
 0.45 = $\underline{\hspace{2cm}}$ 3.50 = $\underline{\hspace{2cm}}$ 0.7 = $\underline{\hspace{2cm}}$

- (5) **Adding decimals.**
 4.37
 $72.6 + 4.853 + 42 = \underline{\hspace{2cm}}$ 129.80
 $4.7 + 223 + 34.98 = \underline{\hspace{2cm}}$ 0.22
 $6941 + 8.6 + 1.19 = \underline{\hspace{2cm}}$ $+ 85.08$
- (6) **Subtracting decimals.**
 $723.8 - \underline{\hspace{2cm}} = 71.53$ 439.58
 $\underline{\hspace{2cm}} - 64.9 = 326.3$ $-$
 $510.94 - \underline{\hspace{2cm}} = 312.7$ 97.99
- (7) **Multiplying decimals.**
 0.479
 $2.85 \times 0.4 = \underline{\hspace{2cm}}$ $61.54 \times 0.07 = \underline{\hspace{2cm}}$ $\times 0.59$
- (8) **Dividing large numbers using 'tidy' numbers.**
Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$
 $665 \div 7 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) - (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$
 $= \underline{\hspace{1cm}} - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

- (1) **Convert these mixed numbers to improper fractions.** *Example: $4\frac{2}{3} = \frac{14}{3}$*
 $2\frac{3}{4} = \underline{\hspace{2cm}}$ $7\frac{2}{9} = \underline{\hspace{2cm}}$
 $4\frac{1}{5} = \underline{\hspace{2cm}}$ $8\frac{5}{6} = \underline{\hspace{2cm}}$
- (2) **Add these positive and negative numbers.**

 $-18 + 13 = \underline{\hspace{2cm}}$ $-9 + 23 = \underline{\hspace{2cm}}$
 $20 + -15 = \underline{\hspace{2cm}}$ $-8 + -9 = \underline{\hspace{2cm}}$
- (3) **Add or subtract these fractions**
 $\frac{1}{2} + \frac{1}{4} = \underline{\hspace{2cm}}$ $\frac{2}{3} + \frac{1}{4} = \underline{\hspace{2cm}}$
 $\frac{5}{6} - \frac{1}{3} = \underline{\hspace{2cm}}$ $\frac{4}{5} - \frac{3}{10} = \underline{\hspace{2cm}}$
- (4) **Find the percentage of these numbers.**
 50% of 250 = $\underline{\hspace{2cm}}$ 20% of 140 = $\underline{\hspace{2cm}}$
 $66\frac{2}{3}\%$ of 120 = $\underline{\hspace{2cm}}$ 75% of 240 = $\underline{\hspace{2cm}}$

- (5) **Adding decimals.**
 75.81
 $79.96 + 58.3 + 52 = \underline{\hspace{2cm}}$ 3.35
 $64.75 + \underline{\hspace{2cm}} + 29 = 130.45$ 462.07
 $59 + 4.4 + \underline{\hspace{2cm}} = 81.13$ $+ 0.98$
- (6) **Subtracting decimals.**
 $329.2 - 16.4 = \underline{\hspace{2cm}}$ 83.95
 $858.87 - 57.24 = \underline{\hspace{2cm}}$ $- 7.82$
 $243.62 - 98.9 = \underline{\hspace{2cm}}$
- (7) **Multiplying large numbers using 'tidy' numbers.**
Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$
 $475 \times 5 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) - (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$
 $= \underline{\hspace{1cm}} - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$
- (8) **Dividing decimals with remainders.**
 $6 \overline{) 56.1}$ $9 \overline{) 5.708}$
 $4 \overline{) 8.93}$ $7 \overline{) 82.43}$

(1) Round these numbers to 2 decimal places.

4.637 = _____ 3.715 = _____
 20.109 = _____ 9.1237 = _____

(2) Write two smaller equivalent fractions for each fraction given.



$\frac{12}{48} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$ $\frac{18}{54} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

(3) Find the percentage of these decimals.

10% of 1.50 = _____ $33\frac{1}{3}\%$ of 2.10 = _____
 40% of 21.80 = _____ 90% of 3.60 = _____

(4) Convert these fractions to percentages

$\frac{1}{3} = \frac{\quad}{\quad}\%$ $\frac{3}{5} = \frac{\quad}{\quad}\%$ $\frac{2}{10} = \frac{\quad}{\quad}\%$
 $\frac{3}{100} = \frac{\quad}{\quad}\%$ $\frac{3}{40} = \frac{\quad}{\quad}\%$ $\frac{7}{8} = \frac{\quad}{\quad}\%$

(5) Adding large numbers.

252
 3713 + 712 + 43 = _____ 63
 521 + 76 + 424 = _____ 10936
 92 + 194 + 4474 = _____ + 512

(6) Subtracting large numbers.

2836 - _____ = 1526 13359
 _____ - 2068 = 794 -
 21753 - _____ = 17096 6531

(7) Multiplying whole numbers.

290
 795 413
 x 5 x 6

(8) Dividing large numbers.

$2 \overline{) 576}$ $5 \overline{) 1725}$
 $3 \overline{) 618}$ $4 \overline{) 2864}$

(1) Solve these equations with mixed number answers.



$7d + 19 = 71$ $d = \frac{\quad}{\quad}$
 $8k - 13 = 65$ $k = \frac{\quad}{\quad}$

(2) Add or subtract these fractions

$\frac{5}{6} + \frac{1}{3} = \frac{\quad}{\quad}$ $\frac{3}{4} + \frac{2}{5} = \frac{\quad}{\quad}$
 $\frac{7}{9} - \frac{1}{3} = \frac{\quad}{\quad}$ $\frac{4}{5} - \frac{2}{3} = \frac{\quad}{\quad}$

(3) Add +, -, × or ÷ to make each statement true. Remember ... **BEDMAS**

5 ___ 6 ___ 13 = 43 31 ___ 2 ___ 9 = 13
 9 ___ 7 ___ 4 = 37 56 ___ 8 ___ 9 = 16

(4) Convert these improper fractions to mixed numbers.



$\frac{23}{6} = \frac{\quad}{\quad}$ $\frac{37}{8} = \frac{\quad}{\quad}$
 $\frac{68}{8} = \frac{\quad}{\quad}$ $\frac{75}{9} = \frac{\quad}{\quad}$

(5) Adding large numbers.

1765
 464 + 18 + 2738 = _____ 81
 553 + _____ + 74 = 3412 35223
 71 + 942 + _____ = 1670 + 462

(6) Subtracting large numbers.

1289 - 35 = _____ 5487
 13247 - 695 = _____ - 642
 23785 - 6321 = _____

(7) Multiplying large numbers using place value.

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$
 $384 \times 4 = (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})$
 = _____ + _____ + _____ = _____

(8) Dividing large numbers using multiples of 10.

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$
 $376 \div 4 = (\underline{\quad} \div \underline{\quad}) + (\underline{\quad} \div \underline{\quad})$
 = _____ + _____ = _____

(1) What is the **place value** of the **BOLD** digit and what does it mean.

$8.63 = \underline{\quad} = \underline{\quad}$ $2.104 = \underline{\quad} = \underline{\quad}$

$1.94 = \underline{\quad} = \underline{\quad}$ $34.5 = \underline{\quad} = \underline{\quad}$

(2) **Round** these numbers to **2 significant figures**.

$236900 = \underline{\quad}$ $3541 = \underline{\quad}$

$0.0324 = \underline{\quad}$ $0.0709 = \underline{\quad}$

(3) **Complete** these ratios.

Example: The ratio 3:4 is the same as 6:8.



$4:5 = \underline{\quad}:40$ $9:\underline{\quad} = 27:24$

$\underline{\quad}:42 = 5:7$ $64:24 = 8:\underline{\quad}$

(4) **Write** these **standard forms** as **numbers**.

Example: $520000 = 5.2 \times 10^5$ $0.00014 = 1.4 \times 10^{-4}$



$2.3 \times 10^4 = \underline{\quad}$ $1.82 \times 10^3 = \underline{\quad}$

$6.4 \times 10^{-5} = \underline{\quad}$ $4.38 \times 10^{-2} = \underline{\quad}$

(5) **Adding** decimals. 291.8

$90.03 + 43.4 + 8.6 = \underline{\quad}$ 2.4

$5.74 + 4 + 38.9 = \underline{\quad}$ 5341.0

$91 + 1.96 + 54.3 = \underline{\quad}$ + 38.8

(6) **Subtracting** decimals.

$471.1 - \underline{\quad} = 71.9$ 193.35

$\underline{\quad} - 46.38 = 509.63$ -

$642.17 - \underline{\quad} = 182.57$ 88.79

(7) **Multiplying** decimals.

$38.5 \times 4 = \underline{\quad}$ $7.29 \times 6 = \underline{\quad}$ $5.14 \times 7.3 = \underline{\quad}$

(8) **Dividing** large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$224 \div 8 = (\underline{\quad} \div \underline{\quad}) - (\underline{\quad} \div \underline{\quad})$

$= \underline{\quad} - \underline{\quad} = \underline{\quad}$

(1) **Solve** these **equations** with mixed number answers.

$7d + 19 = 102$ $d = \underline{\quad}$

$8k - 23 = 78$ $k = \underline{\quad}$



(2) **Write** these **numbers** in **standard form**.

Example: $520000 = 5.2 \times 10^5$ $0.00014 = 1.4 \times 10^{-4}$



$610000 = \underline{\quad}$ $0.000034 = \underline{\quad}$

$00.0792 = \underline{\quad}$ $5180000 = \underline{\quad}$

(3) A car is travelling at 90 kilometres per hour. How far will the car travel in

3 hours $\underline{\quad}$

5 hours $\underline{\quad}$

1.5 hours $\underline{\quad}$?



(4) **Convert** these **decimals** to **fractions**.

$0.5 = \underline{\quad}$ $0.48 = \underline{\quad}$ $0.05 = \underline{\quad}$

$0.75 = \underline{\quad}$ $0.66 = \underline{\quad}$ $0.002 = \underline{\quad}$

(5) **Adding** decimals. 73.81

$72.96 + 58.3 + 59 = \underline{\quad}$ 0.35

$69.75 + \underline{\quad} + 24 = 130.54$ 462.08

$59 + 4.4 + \underline{\quad} = 81.31$ + 5.97

(6) **Subtracting** decimals.

$326.2 - 19.4 = \underline{\quad}$ 58.84

$587.27 - 58.84 = \underline{\quad}$ - 7.28

$289.62 - 65.9 = \underline{\quad}$

(7) **Multiplying** large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$386 \times 5 = (\underline{\quad} \times \underline{\quad}) - (\underline{\quad} \times \underline{\quad})$

$= \underline{\quad} - \underline{\quad} = \underline{\quad}$

(8) **Dividing** decimals.


$3 \overline{) 1.98}$

$4 \overline{) 34.08}$

$6 \overline{) 29.4}$

$7 \overline{) 2.002}$

- (1) **Order of operations.** **BEDMAS**
- $45 + 84 \div 7 = \underline{\hspace{2cm}}$ $180 - 7 \times 15 = \underline{\hspace{2cm}}$
- $3 \times 9 + 4^2 = \underline{\hspace{2cm}}$ $4(4 + 7 \times 3) = \underline{\hspace{2cm}}$

- (2) **Complete these ratios.** 
- Example: The ratio 3:4 is the same as 6:8.*
- $27:18 = \underline{\hspace{1cm}}:2$ $7:\underline{\hspace{1cm}} = 28:36$
- $\underline{\hspace{1cm}}:8 = 3:24$ $40:75 = 8:\underline{\hspace{1cm}}$

- (3) **Write these standard forms as numbers.**
- Example: $520000 = 5.2 \times 10^5$ $0.00014 = 1.4 \times 10^{-4}$*
- $5.6 \times 10^3 = \underline{\hspace{2cm}}$ $6.3 \times 10^5 = \underline{\hspace{2cm}}$
- $8.1 \times 10^{-4} = \underline{\hspace{2cm}}$ $9.05 \times 10^{-3} = \underline{\hspace{2cm}}$


- (4) **Convert these fractions to decimals.**
- $\frac{1}{2} = \underline{\hspace{1cm}}$ $\frac{2}{5} = \underline{\hspace{1cm}}$ $\frac{5}{3} = \underline{\hspace{1cm}}$
- $\frac{2}{3} = \underline{\hspace{1cm}}$ $\frac{7}{10} = \underline{\hspace{1cm}}$ $\frac{1}{20} = \underline{\hspace{1cm}}$

- (5) **Adding large numbers.**
- $822 + 4765 + 34 = \underline{\hspace{2cm}}$ 938
 12587
 20
 $34 + 482 + 3279 = \underline{\hspace{2cm}}$ $+ 402$
 $6149 + 81 + 916 = \underline{\hspace{2cm}}$


- (6) **Subtracting large numbers.**
- $7283 - \underline{\hspace{2cm}} = 7135$ 3959
 $\underline{\hspace{2cm}} - 694 = 3236$ $-$
 $11127 - \underline{\hspace{2cm}} = 8090$ 3798

- (7) **Multiplying whole numbers.**
- $931 \times 8 = \underline{\hspace{2cm}}$ $752 \times 9 = \underline{\hspace{2cm}}$ 274
 $\times 8$ $\times 9$ $\times 76$

- (8) **Dividing large numbers, some with remainders.**
- $6 \overline{) 474}$ $8 \overline{) 5792}$
 $7 \overline{) 553}$ $9 \overline{) 8439}$

- (1) **Write these numbers in standard form.** 
- Example: $520000 = 5.2 \times 10^5$ $0.00014 = 1.4 \times 10^{-4}$*
- $4500000 = \underline{\hspace{2cm}}$ $0.0063 = \underline{\hspace{2cm}}$
- $0.000592 = \underline{\hspace{2cm}}$ $674000 = \underline{\hspace{2cm}}$

- (2) **Find the percentage of these decimals.**
- 50% of $7.2 = \underline{\hspace{2cm}}$ $33\frac{1}{3}\%$ of $12.9 = \underline{\hspace{2cm}}$
- 25% of $6.4 = \underline{\hspace{2cm}}$ 90% of $6.0 = \underline{\hspace{2cm}}$

- (3) **Meat costs \$16.60 per kilogram.** 
- How much would it cost to buy ...
- 2 kgs of meat $\underline{\hspace{2cm}}$
- 0.5 kgs of meat $\underline{\hspace{2cm}}$
- 1.25 kgs of meat $\underline{\hspace{2cm}}$?

- (4) **Add +, -, × or ÷ to make each statement true. Remember ... BEDMAS**
- $6 \underline{\hspace{0.2cm}} 7 \underline{\hspace{0.2cm}} 9 = 51$ $80 \underline{\hspace{0.2cm}} 5 \underline{\hspace{0.2cm}} 4 = 60$
- $17 \underline{\hspace{0.2cm}} 32 \underline{\hspace{0.2cm}} 4 = 25$ $22 \underline{\hspace{0.2cm}} 8 \underline{\hspace{0.2cm}} 3 = 46$

- (5) **Adding large numbers.**
- $699 + 4613 + 70 = \underline{\hspace{2cm}}$ 949
 3273
 $76 + \underline{\hspace{2cm}} + 3171 = 3901$ 60
 $2389 + 58 + \underline{\hspace{2cm}} = 3049$ $+ 541$

- (6) **Subtracting large numbers.**
- $1582 - 727 = \underline{\hspace{2cm}}$ 16325
 $25073 - 902 = \underline{\hspace{2cm}}$ $- 945$
 $74075 - 8516 = \underline{\hspace{2cm}}$

- (7) **Multiplying large numbers using place value.**
- Example: $231 \times 3 = (200 \div 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$*
- $583 \times 7 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$
 $= \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

- (8) **Dividing large numbers using multiples of 10.**
- Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$*
- $954 \div 9 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$
 $= \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

Number Knowledge Progress Assessment 3

Practical / oral assessment: **Ask** each question as outlined below. **Record** the results by circling yes or no

	Practical / Oral Questions (Supply your child with some paper)	Result (circle)																																																																																																						
1	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to recite a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																						
2	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to write a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																						
3	Write up to 10 3, 4, 5 or 6 digit decimal numbers with up to 3 digits after the decimal point. Ask your child to round each decimal to the nearest 1 d.p. and 2 d.p.	yes / no																																																																																																						
4	<p>Addition and subtraction numeracy facts.</p> <p>Tick each correct answer.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 5%;"></th> <th style="width: 25%;"></th> <th style="width: 5%;"></th> <th style="width: 25%;"></th> <th style="width: 5%;"></th> </tr> </thead> <tbody> <tr> <td>36 - 8 = 28</td> <td>✓</td> <td>13 + 4 = 17</td> <td>✓</td> <td>25 - 6 = 19</td> <td>✓</td> </tr> <tr> <td>7 + 31 = 38</td> <td></td> <td>29 - 8 = 21</td> <td></td> <td>9 + 14 = 23</td> <td></td> </tr> <tr> <td>32 - 5 = 27</td> <td></td> <td>28 + 2 = 30</td> <td></td> <td>23 - 2 = 21</td> <td></td> </tr> <tr> <td>19 + 7 = 26</td> <td></td> <td>21 - 9 = 12</td> <td></td> <td>31 + 3 = 34</td> <td></td> </tr> <tr> <td>30 - 6 = 24</td> <td></td> <td>4 + 18 = 22</td> <td></td> <td>25 - 2 = 23</td> <td></td> </tr> <tr> <td>15 + 6 = 21</td> <td></td> <td>32 - 8 = 24</td> <td></td> <td>7 + 15 = 22</td> <td></td> </tr> <tr> <td>24 - 7 = 17</td> <td></td> <td>44 + 1 = 45</td> <td></td> <td>26 - 7 = 19</td> <td></td> </tr> <tr> <td>2 + 24 = 26</td> <td></td> <td>24 - 2 = 22</td> <td></td> <td>5 - 35 = 40</td> <td></td> </tr> <tr> <td>30 - 9 = 21</td> <td></td> <td>8 + 17 = 25</td> <td></td> <td>37 - 6 = 31</td> <td></td> </tr> <tr> <td>15 + 8 = 23</td> <td></td> <td>25 - 7 = 18</td> <td></td> <td>17 + 6 = 23</td> <td></td> </tr> <tr> <td>23 - 6 = 17</td> <td></td> <td>2 + 37 = 39</td> <td></td> <td>48 - 9 = 39</td> <td></td> </tr> <tr> <td>4 + 25 = 29</td> <td></td> <td>22 - 3 = 19</td> <td></td> <td>3 + 23 = 26</td> <td></td> </tr> <tr> <td>32 - 6 = 26</td> <td></td> <td>16 + 6 = 22</td> <td></td> <td>44 - 8 = 36</td> <td></td> </tr> <tr> <td>14 + 7 = 21</td> <td></td> <td>37 - 2 = 35</td> <td></td> <td>6 + 8 = 24</td> <td></td> </tr> <tr> <td>18 - 2 = 16</td> <td></td> <td>19 + 6 = 25</td> <td></td> <td>28 - 3 = 25</td> <td></td> </tr> <tr> <td>8 + 16 = 24</td> <td></td> <td>21 - 7 = 14</td> <td></td> <td>8 + 18 = 26</td> <td></td> </tr> </tbody> </table>							36 - 8 = 28	✓	13 + 4 = 17	✓	25 - 6 = 19	✓	7 + 31 = 38		29 - 8 = 21		9 + 14 = 23		32 - 5 = 27		28 + 2 = 30		23 - 2 = 21		19 + 7 = 26		21 - 9 = 12		31 + 3 = 34		30 - 6 = 24		4 + 18 = 22		25 - 2 = 23		15 + 6 = 21		32 - 8 = 24		7 + 15 = 22		24 - 7 = 17		44 + 1 = 45		26 - 7 = 19		2 + 24 = 26		24 - 2 = 22		5 - 35 = 40		30 - 9 = 21		8 + 17 = 25		37 - 6 = 31		15 + 8 = 23		25 - 7 = 18		17 + 6 = 23		23 - 6 = 17		2 + 37 = 39		48 - 9 = 39		4 + 25 = 29		22 - 3 = 19		3 + 23 = 26		32 - 6 = 26		16 + 6 = 22		44 - 8 = 36		14 + 7 = 21		37 - 2 = 35		6 + 8 = 24		18 - 2 = 16		19 + 6 = 25		28 - 3 = 25		8 + 16 = 24		21 - 7 = 14		8 + 18 = 26		yes / no
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- (1) **Add and subtract** these integers.
- $-21 + 17 = \underline{\hspace{2cm}}$ $-18 - 14 = \underline{\hspace{2cm}}$
- $32 - -15 = \underline{\hspace{2cm}}$ $-41 - -29 = \underline{\hspace{2cm}}$

- (2) **Estimate** an answer by rounding the \$\$\$ first.
- $\$8.90 \times 5 = \underline{\hspace{2cm}}$ $\$7.25 \times 9 = \underline{\hspace{2cm}}$
- $\$48.60 \div 7 = \underline{\hspace{2cm}}$ $\$63.80 \div 8 = \underline{\hspace{2cm}}$

- (3) Find the **square root** of these numbers.
- $\sqrt{49} = \underline{\hspace{2cm}}$ $\sqrt{144} = \underline{\hspace{2cm}}$
- $\sqrt{225} = \underline{\hspace{2cm}}$ $\sqrt{400} = \underline{\hspace{2cm}}$

- (4) **Convert** these decimals to fractions.
- $0.25 = \underline{\hspace{2cm}}$ $0.6 = \underline{\hspace{2cm}}$ $0.05 = \underline{\hspace{2cm}}$
- $0.9 = \underline{\hspace{2cm}}$ $0.3 = \underline{\hspace{2cm}}$ $1.5 = \underline{\hspace{2cm}}$

- (5) **Adding** decimals. 0.25
- $80.09 + 6.8 + 293.3 = \underline{\hspace{2cm}}$ 317.15
- $9.31 + 382.94 + 62.7 = \underline{\hspace{2cm}}$ 0.57
- $5.785 + 4.20 + 16.67 = \underline{\hspace{2cm}}$ + 68.80

- (6) **Subtracting** decimals.
- $468.8 - \underline{\hspace{2cm}} = 395.9$ 627.5
- $\underline{\hspace{2cm}} - 386.2 = 178.67$ -
- $3926.7 - \underline{\hspace{2cm}} = 3576.91$ 567.9

- (7) **Multiplying** decimals.
- $53.3 \times 5 = \underline{\hspace{2cm}}$ $94.1 \times 4.9 = \underline{\hspace{2cm}}$
- $\underline{\hspace{2cm}} \times 8 = \underline{\hspace{2cm}}$

- (8) **Dividing** large numbers using 'tidy' numbers.
- Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$*
- $882 \div 9 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) - (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$
- $= \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

- (1) **Order of operations.**
- $25 + 108 \div 9 = \underline{\hspace{2cm}}$ $81 - 7 \times 8 = \underline{\hspace{2cm}}$
- $5 \times 6 + 4^2 = \underline{\hspace{2cm}}$ $3(10 + 5 \times 6) = \underline{\hspace{2cm}}$

- (2) Find the **square or powers** of these numbers.
- $9^2 = \underline{\hspace{2cm}}$ $7^2 = \underline{\hspace{2cm}}$
- $10^3 = \underline{\hspace{2cm}}$ $5^4 = \underline{\hspace{2cm}}$

- (3) **Convert** these percentages to fractions.
- $75\% = \underline{\hspace{2cm}}$ $40\% = \underline{\hspace{2cm}}$ $37\% = \underline{\hspace{2cm}}$
- $66\frac{2}{3}\% = \underline{\hspace{2cm}}$ $125\% = \underline{\hspace{2cm}}$ $6\% = \underline{\hspace{2cm}}$

- (4) **Round** these numbers to 1 decimal place.
- $4.96 = \underline{\hspace{2cm}}$ $7.21 = \underline{\hspace{2cm}}$
- $12.739 = \underline{\hspace{2cm}}$ $32.847 = \underline{\hspace{2cm}}$

- (5) **Adding** decimals. 8.81
- $387.5 + 2.64 + 62.1 = \underline{\hspace{2cm}}$ 0.57
- $89.34 + \underline{\hspace{2cm}} + 2.15 = 675.09$ 41.43
- $144.5 + 68.69 + \underline{\hspace{2cm}} = 233.47$ + 3.90

- (6) **Subtracting** decimals.
- $402.8 - 48.4 = \underline{\hspace{2cm}}$ 595.06
- $247.70 - 66.32 = \underline{\hspace{2cm}}$ - 48.85
- $2637.73 - 465.8 = \underline{\hspace{2cm}}$

- (7) **Multiplying** large numbers using 'tidy' numbers.
- Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$*
- $596 \times 6 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) - (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$
- $= \underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

- (8) **Dividing** decimals.
- $6 \overline{) 4.44}$ $7 \overline{) 3.136}$
- $8 \overline{) 41.6}$ $9 \overline{) 28.62}$

- (1) Convert these mixed numbers to improper fractions.

$$2\frac{3}{5} = \underline{\hspace{2cm}} \quad 6\frac{8}{9} = \underline{\hspace{2cm}}$$

$$7\frac{5}{8} = \underline{\hspace{2cm}} \quad 9\frac{2}{3} = \underline{\hspace{2cm}}$$



- (2) Find each fraction of these decimals.

$$\frac{2}{3} \text{ of } 1.2 = \underline{\hspace{2cm}} \quad \frac{5}{8} \text{ of } 41.6 = \underline{\hspace{2cm}}$$

$$\frac{3}{4} \text{ of } 2.4 = \underline{\hspace{2cm}} \quad \frac{3}{7} \text{ of } 23.8 = \underline{\hspace{2cm}}$$

- (3) Round these numbers to 1 significant figure.

$$63500 = \underline{\hspace{2cm}} \quad 946 = \underline{\hspace{2cm}}$$

$$0.087 = \underline{\hspace{2cm}} \quad 0.00639 = \underline{\hspace{2cm}}$$

- (4) Convert these decimals to percentages.

$$0.67 = \underline{\hspace{2cm}} \quad 0.3 = \underline{\hspace{2cm}} \quad 0.95 = \underline{\hspace{2cm}}$$

$$0.75 = \underline{\hspace{2cm}} \quad 0.05 = \underline{\hspace{2cm}} \quad 1.2 = \underline{\hspace{2cm}}$$

- (5) Adding large numbers. 570

$$\begin{array}{r} 347 + 1129 + 53 = \underline{\hspace{2cm}} \\ 30 + 998 + 2745 = \underline{\hspace{2cm}} \\ 1426 + 70 + 298 = \underline{\hspace{2cm}} \end{array}$$

- (6) Subtracting large numbers.

$$\begin{array}{r} 2896 - \underline{\hspace{2cm}} = 2032 \\ \underline{\hspace{2cm}} - 538 = 4149 \\ 6353 - \underline{\hspace{2cm}} = 3928 \end{array}$$

- (7) Multiplying whole numbers. 583

$$\begin{array}{r} 926 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 623 \\ \times 9 \\ \hline \end{array}$$

- (8) Dividing large numbers.

$$\begin{array}{r} 9 \overline{) 351} \\ 8 \overline{) 608} \end{array} \quad \begin{array}{r} 6 \overline{) 3162} \\ 7 \overline{) 4613} \end{array}$$

- (1) Round these numbers to 2 decimal places.

$$0.327 = \underline{\hspace{2cm}} \quad 0.0639 = \underline{\hspace{2cm}}$$

$$30.109 = \underline{\hspace{2cm}} \quad 140.275 = \underline{\hspace{2cm}}$$

- (2) Find the percentage of these decimals.

$$10\% \text{ of } 6.8 = \underline{\hspace{2cm}} \quad 33\frac{1}{2}\% \text{ of } 15.6 = \underline{\hspace{2cm}}$$

$$25\% \text{ of } 4.96 = \underline{\hspace{2cm}} \quad 5\% \text{ of } 8.4 = \underline{\hspace{2cm}}$$

- (3) Add or subtract these fractions

$$\frac{1}{2} + \frac{3}{4} = \underline{\hspace{2cm}} \quad \frac{2}{3} + \frac{5}{6} = \underline{\hspace{2cm}}$$

$$\frac{2}{3} - \frac{1}{6} = \underline{\hspace{2cm}} \quad \frac{7}{8} - \frac{1}{4} = \underline{\hspace{2cm}}$$

- (4) Convert these fractions to decimals.

$$\frac{2}{5} = \underline{\hspace{2cm}} \quad \frac{3}{4} = \underline{\hspace{2cm}} \quad \frac{7}{8} = \underline{\hspace{2cm}}$$

$$\frac{1}{20} = \underline{\hspace{2cm}} \quad \frac{9}{10} = \underline{\hspace{2cm}} \quad \frac{3}{2} = \underline{\hspace{2cm}}$$

- (5) Adding large numbers. 357

$$\begin{array}{r} 412 + 1354 + 82 = \underline{\hspace{2cm}} \\ 98 + \underline{\hspace{2cm}} + 1367 = 1672 \\ 2345 + 82 + \underline{\hspace{2cm}} = 2613 \end{array}$$

- (6) Subtracting large numbers.

$$\begin{array}{r} 4037 - 387 = \underline{\hspace{2cm}} \\ 5903 - 917 = \underline{\hspace{2cm}} \\ 10283 - 827 = \underline{\hspace{2cm}} \end{array}$$

- (7) Multiplying large numbers using place value.

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$

$$\begin{array}{l} 756 \times 7 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) \\ = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \end{array}$$

- (8) Dividing large numbers using multiples of 10.

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$

$$\begin{array}{l} 1664 \div 8 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) \\ = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \end{array}$$

(1) Solve these equations with mixed number answers.



$4(d + 7) = 53$ $d =$ _____

$5(k - 6) = 19$ $k =$ _____

(2) Add and subtract these integers.

$-45 + 62 =$ _____ $-34 - 18 =$ _____

$25 - -17 =$ _____ $-43 - -27 =$ _____

(3) Find the percentage of these decimals.

50% of 1.7 = _____ 5% of 6.4 = _____

$66\frac{2}{3}\%$ of 5.4 = _____ 80% of 3.5 = _____

(4) Convert these percentages to decimals.

65% = _____ 8% = _____ 37% = _____

80% = _____ $33\frac{1}{3}\%$ = _____ 150% = _____

(5) Adding decimals. 9.5

$30.84 + 556.73 + 9.2 =$ _____ 4133.5

$293.29 + 6.1 + 74.58 =$ _____ 71.5

$4.1 + 39.6 + 628.7 =$ _____ + 621.1

(6) Subtracting decimals.

$271.34 -$ _____ = 187.84 496.13

_____ - 21.53 = 457.20 -

$1788.4 -$ _____ = 125.87 443.49

(7) Multiplying decimals. 41.7

73.6×5 9.03 \times 8 x 6.9

_____ _____ _____

_____ _____ _____

(8) Dividing large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$672 \div 7 = ($ _____ \div _____ $) - ($ _____ \div _____ $)$

$=$ _____ $-$ _____ $=$ _____

(1) A car is travelling at 90 kilometres per hour. How far will the car travel in ...

4 hours _____

7 hours _____

2.25 hours _____ ?



(2) Write two smaller equivalent fractions for each fraction given.

$\frac{24}{48} =$ _____ $=$ _____ $\frac{32}{72} =$ _____ $=$ _____

(3) Add +, -, × or ÷ to make each statement true. Remember ... **BEDMAS**

6 _____ 3 _____ $11 = 29$ 45 _____ 7 _____ $4 = 17$

36 _____ 6 _____ $4 = 12$ 21 _____ 56 _____ $8 = 14$

(4) Convert these improper fractions to mixed numbers

$\frac{45}{6} =$ _____

$\frac{50}{7} =$ _____

$\frac{39}{9} =$ _____

$\frac{63}{8} =$ _____



(5) Adding decimals. 341.9

$24.6 + 317.2 + 3.65 =$ _____ 32.9

$144.5 +$ _____ $+ 2.75 = 157.67$ 5150.8

$6.89 + 49.3 +$ _____ $= 302.54$ + 27.7

(6) Subtracting decimals.

$159.45 - 6.27 =$ _____ 159.83

$75.782 - 2.36 =$ _____ - 86.96

$942.0 - 474.23 =$ _____ _____

(7) Multiplying large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$585 \times 8 = ($ _____ \times _____ $) - ($ _____ \times _____ $)$

$=$ _____ $-$ _____ $=$ _____

(8) Dividing decimals.

$4 \overline{) 3.32}$

$7 \overline{) 51.03}$

$9 \overline{) 81.9}$

$8 \overline{) 623.2}$

- (1) Solve these equations with mixed number answers.

$$8(d + 4) = 71 \quad d = \underline{\hspace{2cm}}$$

$$7(k - 9) = 29 \quad k = \underline{\hspace{2cm}}$$



- (2) Add or subtract these fractions

$$\frac{3}{4} + \frac{3}{4} = \underline{\hspace{2cm}} \quad \frac{2}{3} + \frac{4}{5} = \underline{\hspace{2cm}}$$

$$\frac{7}{8} - \frac{1}{4} = \underline{\hspace{2cm}} \quad \frac{3}{4} - \frac{2}{3} = \underline{\hspace{2cm}}$$

- (3) Complete these ratios.

$$5:8 = \underline{\hspace{1cm}}:32 \quad 14:\underline{\hspace{1cm}} = 7:9$$

$$\underline{\hspace{1cm}}:3 = 18:6 \quad 9:5 = 54:\underline{\hspace{1cm}}$$



- (4) Write these standard forms as numbers.

$$1.2 \times 10^4 = \underline{\hspace{2cm}} \quad 5.7 \times 10^5 = \underline{\hspace{2cm}}$$

$$3.4 \times 10^{-3} = \underline{\hspace{2cm}} \quad 6.5 \times 10^{-2} = \underline{\hspace{2cm}}$$



- (5) Adding large numbers.

$$1732 + 42 + 953 = \underline{\hspace{2cm}}$$

$$397 + 5890 + 49 = \underline{\hspace{2cm}}$$

$$31 + 389 + 6702 = \underline{\hspace{2cm}}$$

5852

770

36

+ 519

- (6) Subtracting large numbers.

$$6892 - \underline{\hspace{2cm}} = 2060$$

$$\underline{\hspace{2cm}} - 897 = 9144$$

$$7347 - \underline{\hspace{2cm}} = 2389$$

6347

-

1422

- (7) Multiplying whole numbers.

$$\begin{array}{r} 829 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 475 \\ \times 6 \\ \hline \end{array}$$

608

x 37

- (8) Dividing large numbers with remainders.

$$\begin{array}{r} 3 \overline{) 487} \\ \underline{36} \\ 127 \\ \underline{120} \\ 7 \end{array}$$

$$\begin{array}{r} 6 \overline{) 2387} \\ \underline{12} \\ 118 \\ \underline{114} \\ 47 \end{array}$$

$$\begin{array}{r} 5 \overline{) 784} \\ \underline{50} \\ 284 \\ \underline{280} \\ 4 \end{array}$$

$$\begin{array}{r} 8 \overline{) 9217} \\ \underline{64} \\ 281 \\ \underline{240} \\ 417 \end{array}$$

- (1) Order of operations.

BIDMAS

$$7 + 24 \div 6 \times 9 = \underline{\hspace{2cm}} \quad 4 \times 5 - 28 \div 7 = \underline{\hspace{2cm}}$$

$$9^2 - 5 \times 6 + 7 = \underline{\hspace{2cm}} \quad 3(4 + 27 \div 9) = \underline{\hspace{2cm}}$$

- (2) Round these numbers to 2 significant figures.

$$452000 = \underline{\hspace{2cm}} \quad 95100 = \underline{\hspace{2cm}}$$

$$0.00637 = \underline{\hspace{2cm}} \quad 0.1084 = \underline{\hspace{2cm}}$$

- (3) A car is travelling at 80 kilometres per hour. How far will the car travel in

$$5 \text{ hours } \underline{\hspace{2cm}}$$

$$4.5 \text{ hours } \underline{\hspace{2cm}}$$

$$3.75 \text{ hours } \underline{\hspace{2cm}} ?$$



- (4) Convert these fractions to percentages.

$$\frac{3}{4} = \underline{\hspace{2cm}} \quad \frac{2}{3} = \underline{\hspace{2cm}} \quad \frac{2}{5} = \underline{\hspace{2cm}}$$

$$\frac{1}{20} = \underline{\hspace{2cm}} \quad \frac{7}{8} = \underline{\hspace{2cm}} \quad \frac{3}{50} = \underline{\hspace{2cm}}$$

- (5) Adding large numbers.

$$21 + 3484 + 245 = \underline{\hspace{2cm}}$$

$$1876 + \underline{\hspace{2cm}} + 93 = 2127$$

$$254 + 83 + \underline{\hspace{2cm}} = 3162$$

953

4852

73

+ 611

- (6) Subtracting large numbers.

$$5720 - 773 = \underline{\hspace{2cm}}$$

$$7309 - 719 = \underline{\hspace{2cm}}$$

$$13493 - 839 = \underline{\hspace{2cm}}$$

27000

- 795

- (7) Multiplying large numbers using place value.

Example: $231 \times 3 = (200 \times 3) + (30 \times 3) + (1 \times 3) = 600 + 90 + 3 = 693$

$$279 \times 9 = (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \times \underline{\hspace{1cm}})$$

$$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

- (8) Dividing large numbers using multiples of 10.

Example: $145 \div 5 = (100 \div 5) + (45 \div 5) = 20 + 9 = 29$

$$927 \div 9 = (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) + (\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$$

$$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

(1) Add or subtract these fractions

$3\frac{1}{4} + 4\frac{2}{3} =$ _____ $5\frac{1}{2} + 2\frac{3}{4} =$ _____

$1\frac{1}{4} - \frac{7}{8} =$ _____ $3\frac{1}{2} - 1\frac{2}{3} =$ _____

(2) Write these numbers in standard form.



960000 = _____ 0.0072 = _____

0.0051 = _____ 145000000 = _____

(3) Write these standard forms as numbers.

$2.3 \times 10^3 =$ _____ $9.3 \times 10^4 =$ _____

$1.4 \times 10^{-4} =$ _____ $5.2 \times 10^{-2} =$ _____

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

BED WAS

32 ___ 8 ___ 16 = 20 7 ___ 8 ___ 9 = 65

16 ___ 4 ___ 5 = 36 7 ___ 6 ___ 4 ___ 9 = 6

(5) Adding decimals.

53.31

$5.4 + 67.38 + 305.92 =$ _____ 2.10

$47.85 + 239.61 + 2.9 =$ _____ 533.14

$167.6 + 2.8 + 49.3 =$ _____ + 15.96

(6) Subtracting decimals.

$943.43 -$ _____ = 781.48 849.13

_____ - 35.12 = 634.92 -

$2398.3 -$ _____ = 626.78 344.49

(7) Multiplying decimals.

7.45

78.6×5 63.4×9.2

_____ x 5 _____ x 8

(8) Dividing large numbers using 'tidy' numbers.

Example: $195 \div 5 = (200 \div 5) - (5 \div 5) = 20 - 1 = 19$

$368 \div 8 =$ (_____ ÷ _____) - (_____ ÷ _____)

= _____ = _____

(1) Write these numbers in standard form.



36000 = _____ 0.00459 = _____

0.000148 = _____ 70000000 = _____

(2) Complete these ratios.



56:24 = _____ : 3 63: _____ = 7:5

_____ : 45 = 4:9 48:36 = 4: _____

(3) Meat costs \$18.60 per kilogram. How much would it cost to buy ...



2 kgs of meat _____

0.5 kgs of meat _____

1.25 kgs of meat _____ ?

(4) Convert these fractions to decimals.

$\frac{2}{3} =$ _____ $\frac{3}{5} =$ _____ $\frac{5}{100} =$ _____

$\frac{1}{50} =$ _____ $\frac{7}{1000} =$ _____ $\frac{5}{4} =$ _____

(5) Adding decimals.

47.8

$42.6 + 336.2 + 1.75 =$ _____ 5137.7

$415.4 +$ _____ + 7.25 = 721.76 1.5

$3.83 + 44.9 +$ _____ = 203.45 + 352.9

(6) Subtracting decimals.

$537.41 - 8.25 =$ _____ 3774.1

$92.316 - 6.74 =$ _____ - 585.7

$675.00 - 213.64 =$ _____

(7) Multiplying large numbers using 'tidy' numbers.

Example: $296 \times 3 = (300 \times 3) - (4 \times 3) = 900 - 12 = 888$

$586 \times 6 =$ (_____ x _____) - (_____ x _____)

= _____ - _____ = _____

(8) Dividing decimals.

$4 \overline{) 3.84}$

$7 \overline{) 59.22}$

$5 \overline{) 89.5}$

$9 \overline{) 5.148}$

Number Knowledge Progress Assessment 4

Practical / oral assessment: **Ask** each question as outlined below. **Record** the results by circling yes or no

	Practical / Oral Questions (Supply your child with some paper)	Result (circle)																																																																																																																																								
1	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to recite a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																																																								
2	Skip counting in 4's, 6's, 7's, 8's and 9's , ask your child to write a forward and backward sequence of at least the first 10 multiples for each number.	yes / no																																																																																																																																								
3	Write up to 10 3, 4, 5 or 6 digit decimal numbers with up to 3 digits after the decimal point. Ask your child to round each decimal to the nearest 1 d.p. and 2 d.p.	yes / no																																																																																																																																								
4	<p>Addition and subtraction numeracy facts.</p> <p>Tick each correct answer.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> <th style="width: 25%;"></th> <th style="width: 5%;"><input type="checkbox"/></th> </tr> </thead> <tbody> <tr><td>5 + 35 = 40</td><td><input type="checkbox"/></td><td>43 - 8 = 35</td><td><input type="checkbox"/></td><td>2 + 24 = 26</td><td><input type="checkbox"/></td><td>24 - 2 = 22</td><td><input type="checkbox"/></td></tr> <tr><td>37 - 6 = 31</td><td><input type="checkbox"/></td><td>34 + 4 = 38</td><td><input type="checkbox"/></td><td>30 - 9 = 21</td><td><input type="checkbox"/></td><td>8 + 17 = 25</td><td><input type="checkbox"/></td></tr> <tr><td>17 + 6 = 23</td><td><input type="checkbox"/></td><td>23 - 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Curriculum Strand Worksheets Section

(Level 5)

Number & Algebra, Measurement & Geometry, and Statistics Worksheets

Select **ONE** Curriculum Strand Worksheet per week
to be completed in conjunction with
ONE Number Knowledge Worksheet.

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

The place a digit has in a number will affect it's value.

Example: In 57.92, the 9 has a place value of $\frac{1}{10}$ and means 0.9.



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

		Place value	means
(1)	3 0 7.42	_____	7
(2)	5 8107.86	_____	_____
(3)	342. 8 91	_____	_____
(4)	30. 5 14	_____	_____
(5)	9.2 6 4	_____	_____

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

Example: 2**7**5 rounds **up** to 300 (5, 6, 7, 8, 9 \uparrow)
but 8**2**5 rounds **down** to 800 (0, 1, 2, 3, 4 \downarrow)

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

Example: 3**8**05 rounds **up** to 4000 (5, 6, 7, 8, 9 \uparrow)
but 1**3**53 rounds **down** to 1000 (0, 1, 2, 3, 4 \downarrow)

Round these numbers to the nearest ...

	10	100	1000
(6)	1837	_____	_____
(7)	4079	_____	_____
(8)	6325	_____	_____
(9)	14308	_____	_____
(10)	53754	_____	_____

(11) Write these numbers in order from smallest to largest.

- 169
- 0.164
- 1.63
- 16.5
- 1680
- 0.0162

(12) Write these fractions in order from smallest to largest.

- $\frac{1}{2}$ $\frac{1}{6}$
- $\frac{1}{5}$ $\frac{1}{3}$
- $\frac{1}{10}$ $\frac{1}{4}$

(13) Write these fractions in order from smallest to largest.

- $\frac{2}{3}$ $\frac{3}{5}$
- $\frac{5}{6}$ $\frac{3}{4}$
- $\frac{4}{5}$ $\frac{7}{10}$

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



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

factor, multiples, prime

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

Working with **prime numbers**.

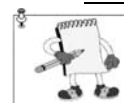
- (17) List the first 10 prime numbers. _____
- (18) List the prime numbers between 60 and 100. _____
- (19) Circle the prime numbers in this list.
33, 35, 37, 39, 45, 47, 49, 51, 53, 57, 59

Working with **multiples**.

- Example: The multiples of 5 are ... 5, 10, 15, 20, 25, 30 etc.*
- (20) List the first 10 multiples of 9. _____
 - (21) List the multiples of 8 between 34 and 60. _____
 - (22) List the multiples of 7 between 50 and 120. _____

Working with **factors**.

- Example: 2 and 3 are factors of 6 as $2 \times 3 = 6$.*
- (23) List the factors of 18. _____
 - (24) List the factors of 40. _____
 - (25) List the factors of 56. _____



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 value 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 $25 + 7 + 80$ is the same as $100 + 12 = 112$

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

Add $65 + 9$ (add 5 to 65, subtract 5 from 9)

Answer: $65 + 9 = 70 + 4 = 74$

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

Add $732 + 456$ (100's) $700 + 400$ (10's) $30 + 50$ (1's) $2 + 6$

Answer: $1100 + 80 + 8 = 1188$

Splitting numbers to make '10'

Work out $485 - 8 = \bullet$ ($485 = 480 + 5$)

$480 - 8 = 472$, Answer: $472 + 5 = 477$



Equal additions to make 'tidy' numbers

Subtract $181 - 93$ (add 7 to both numbers)

Answer: $181 - 93 = 188 - 100 = 88$

Don't subtract ... add

$108 - 79 = \bullet$ is the same as $79 + \bullet = 108$

Use 'tidy' numbers to work this out.

$(79 + 1 = 80, 80 + 20 = 100, 100 + 8 = 108) \Rightarrow 1 + 20 + 8 = 29$

Work out the problems using any strategy you like, but be prepared to talk about which strategy you used.

- (1) $299 - 74 =$ _____
- (2) $522 + 89 =$ _____
- (3) $603 - 75 =$ _____
- (4) $924 - 679 =$ _____
- (5) $198 + 126 =$ _____
- (6) $145 + 261 + 619 =$ _____
- (7) $4396 - 2154 =$ _____
- (8) $85 + 187 =$ _____
- (9) $54 + 98 + 52 =$ _____
- (10) $1524 - 989 =$ _____
- (11) $269 + 1531 =$ _____
- (12) $605 + 391 + 149 =$ _____
- (13) $2704 - 829 =$ _____
- (14) $385 + 457 =$ _____
- (15) $519 - 374 =$ _____
- (16) $1332 + 146 =$ _____
- (17) $853 - 95 =$ _____
- (18) $500 - 245 =$ _____
- (19) $132 + 826 =$ _____
- (20) $375 + 601 + 439 =$ _____

Adding using columns

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

	1	1	2
			34
			1423
			9
			135
			+ 3482
			5083

Rewrite the numbers in a column, lining up numerals with the same place value.

Add each column of numbers, starting with the right hand column.

Rewrite these numbers in columns, then add.

- (21) $9 + 682 + 87 + 3456$ _____
- (22) $394 + 5209 + 8 + 76 + 542 + 95$ _____



Subtracting using columns & renaming

Subtract $653 - 389 = ?$

	5	14	13		5	14	13	
	6 53				6 53			6 53
	389			-	389			389
	4				6			264

... 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.

- (23) $4758 - 1985$ _____
- (24) $6243 - 4679$ _____
- (25) $8000 - 2785$ _____
- (26) $12000 - 5241$ _____

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: _____

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

Here are some **using place value**

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

Rounding to use 'tidy' numbers

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



Using written working forms, some with & without remainders. To work out $85 \div 6$, rewrite as ...

Firstly, $8 \div 6 = 1$
with a remainder of 2

$$\begin{array}{r} 1 \\ 6 \overline{) 8^2 5} \end{array}$$

then $25 \div 6 = 4$
with a remainder of 1

$$\begin{array}{r} 14 \text{ r } 1 \\ 6 \overline{) 8^2 5} \end{array}$$



Work out the problems using any strategy you like, but be prepared to talk about which strategy you used.

- (1) $597 \times 6 =$ _____
- (2) $790 \times 7 =$ _____
- (3) $607 \times 8 =$ _____
- (4) $324 \times 9 =$ _____
- (5) $741 \times 7 =$ _____

Here are some division strategies.

Using known multiples of 10

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

Rounding up or down to use 'tidy' numbers

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



Work out the problems using any strategy you like, but be prepared to talk about which strategy you used

- (6) $108 \div 6 =$ _____
- (7) $171 \div 9 =$ _____
- (8) $1788 \div 6 =$ _____
- (9) $119 \div 7 =$ _____
- (10) $4024 \div 8 =$ _____

Using written working forms

To work out 95×8 , rewrite as ...

Firstly, $8 \times 5 = 40$ $\begin{array}{r} 95 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 95 \\ \times 8 \\ \hline \end{array}$

(Note: small 4 represents 40) $\begin{array}{r} 95 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 95 \\ \times 8 \\ \hline \end{array}$

then, $90 \times 8 = 720$ plus $40 = 760$ $\begin{array}{r} 95 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 95 \\ \times 8 \\ \hline \end{array}$

- (11) $\begin{array}{r} 267 \\ \times 3 \\ \hline \end{array}$ (13) $\begin{array}{r} 876 \\ \times 5 \\ \hline \end{array}$ (15) $\begin{array}{r} 491 \\ \times 64 \\ \hline \end{array}$
- (12) $\begin{array}{r} 598 \\ \times 4 \\ \hline \end{array}$ (14) $\begin{array}{r} 926 \\ \times 8 \\ \hline \end{array}$

- (16) $\begin{array}{r} 7 \overline{) 168} \end{array}$ (18) $\begin{array}{r} 7 \overline{) 943} \end{array}$
- (17) $\begin{array}{r} 8 \overline{) 520} \end{array}$ (19) $\begin{array}{r} 8 \overline{) 1375} \end{array}$

Show your working as you work out this problem.

- (20) At a large high school, 5 computer rooms are going to be set up. working space

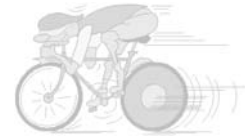
Each room will have 23 computers.

If the cost of one computer is \$1365, how much will it cost to set up the computer rooms?

- (21) The total cost of airfares for five adult fares came to \$1890. How much did each passenger pay?



- (22) The total cost of seven new bicycles was \$4165. How much did each bicycle cost?



- (23) Nine new computers cost \$21150. 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 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: _____

Adding decimal numbers using columns

$$\begin{array}{r} 2 \quad 1 \quad 1 \\ 0.23 \end{array}$$

Add $0.23 + 14 + 9.4 + 135.3 + 3.485 = ?$

$$14.$$

Rewrite the numbers in a column, lining up the decimal points.

$$9.4$$

Add each column of numbers, starting with the right hand column.

$$\begin{array}{r} 135.3 \\ + 3.485 \\ \hline \end{array}$$

$$\underline{162.415}$$

Rewrite these decimals in columns, then add.

(1) $5.7 + 0.09 + 457 + 68.2$

(2) $1.3 + 140.9 + 27 + 51.231 + 2003$ _____ (2)

(1)	_____	_____
	_____	_____
	_____	_____
	+	+
	_____	_____
	_____	_____

Subtracting decimals using columns & renaming

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

$\begin{array}{r} 2 \quad 10 \\ 46.30 \\ - 2.58 \\ \hline 2 \end{array}$	$\begin{array}{r} 5 \quad 12 \quad 10 \\ 46.30 \\ - 2.58 \\ \hline .72 \end{array}$	$\begin{array}{r} 5 \quad 12 \quad 10 \\ 46.30 \\ - 2.58 \\ \hline 43.72 \end{array}$
--------------------------------------------------------------------------	-------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------

... 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 decimals in columns, then subtract.

(3) $217.9 - 149.5$ _____ (4) _____

(4) $5.326 - 1.049$ _____

(5) $14.56 - 9.348$ _____ (6) _____

(6) $42.17 - 2.673$ _____

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.

Rewrite these decimals

in written form layout, then divide.

(9) $14.7 \div 0.6$ _____ (9)

(10) $4.788 \div 0.07$ _____ (10)

Adding zeros and rounding

With some division problems there appears to be no end.

By adding extra zeros, you can keep dividing.

Example: $18.7 \div 7 = ?$

$7 \overline{) 18.7000}$	02.6714	etc.
--------------------------	-----------	------

Round this answer to 2 decimal places.

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

Rewrite these decimals in written form layout, add 3 zeros, then divide.

(11) $13.7 \div 0.8$ _____

(12) $2.345 \div 0.09$ _____ (12)

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

Work out the cost of printing 26584 copies.



(14) Nine C.D.'s cost \$143.55.



If they all cost the same price, what is the cost of one C.D.?

1 C.D. costs = \$ _____

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 ...

$$\begin{array}{r} 14.5 \\ \times 2.8 \\ \hline 1160 \\ 2900 \\ \hline 40.60 \end{array}$$

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: 2 digits to the right of the decimal points, so 2 in from the right.



Rewrite these decimals in written form layout, then multiply.

(7) 4.78×0.9 _____ (7)

(8) 2.345×0.07 _____ (8)

The aim of this activity sheet is to use addition and subtraction strategies to work out 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 a number is multiplied by itself, such as ... 1×1 , 2×2 , 3×3 , 4×4 etc. the answers that are created are known as **squares**.

These can be written as 1^2 , 2^2 , 3^2 , 4^2 , etc.

We say, 4^2 as 'four squared', which means .. $4 \times 4 = 16$.



Work out the squares of these numbers.

- (1) $8^2 =$ _____
- (2) $7^2 =$ _____
- (3) $5^2 =$ _____
- (4) $11^2 =$ _____
- (5) 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 $3 \times 3 = 9$, then $\sqrt{9} = 3$

(i.e. two numbers the same that multiply to 9)



Work out the square root of these numbers.

- (6) $\sqrt{81} =$ _____
- (7) $\sqrt{36} =$ _____
- (8) $\sqrt{144} =$ _____
- (9) $\sqrt{400} =$ _____
- (10) 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.

- (11) $2^6 =$ _____
- (12) $3^4 =$ _____
- (13) $7^3 =$ _____

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	<i>Examples:</i>	
O	= of (E = exponents)	$6 \times 8 + 12$	$13 + 4 \times 3$
D	= division	$= 48 + 12$	$= 13 + 12$
M	= multiplication	$= 60$	$= 25$
A	= addition	$36 \div 4 - 7$	$10 + 27 \div 9 - 7$
S	= subtraction	$= 9 - 7$	$= 10 + 3 - 7$
		$= 2$	$= 6$

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



- (14) $9 \times 7 + 22 =$ _____
- (15) $6 \times 8 - 29 =$ _____
- (16) $75 \div 5 - 8 =$ _____

- (17) $24 + 56 \div 7 =$ _____
- (18) $62 - 6 \times 4 + 13 =$ _____
- (19) $74 + 36 \div 9 - 6 =$ _____
- (20) $9 \times 8 - 48 \div 4 =$ _____
- (21) $49 \div 7 + 3 \times 6 =$ _____

Problems involving brackets.

Example: $4(3 + 4)$ means $4 \times (3 + 4) = 4 \times 7 = 28$

$5(29 - 4 \times 6) = 5(29 - 24) = 5 \times 5 = 25$

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

- (22) $3(4 \times 5 + 9) =$ _____
- (23) $6(33 - 3 \times 1) =$ _____
- (24) $2(5 \times 8 - 12) =$ _____

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.

- (25) $2(4 \times 3 + 8) =$ _____
- (26) $5(30 - 3 \times 6) =$ _____
- (27) $6(36 \div 9 + 4^2) =$ _____

Add $+$, \times or \div to make each statement true. Remember ...

BEDMAS

- (28) $6 \quad \underline{\quad} \quad 6 \quad \underline{\quad} \quad 9 = 45$
- (29) $35 \quad \underline{\quad} \quad 5 \quad \underline{\quad} \quad 8 = 15$
- (30) $8 \quad \underline{\quad} \quad 6 \quad \underline{\quad} \quad 27 \quad \underline{\quad} \quad 9 = 51$



- (31) Aimee bought 7 books worth \$9.00 each and 6 pens worth \$3.50 each. How much did she spend altogether?



The aim of this activity sheet is to understand square / square roots and 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 finding squares or square roots and questions using the order of operation rules.

Example: If a square tiled area has sides of 15 tiles, how many tiles are in this area?

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: _____

Numbers can be rounded to a certain number of **decimal places** (d.p.) to obtain an approximate answer.

When rounding a number to a certain number of decimal places, count the required digits from the decimal point. If the next digit is 5 or above, add 1 to the last digit. If the next digit is below 5, leave it as it is.

Example: Round these numbers to 1 d.p.

4.569 rounds up to 4.6 (5, 6, 7, 8, 9 ↑)

but 2.437 rounds down to 2.4 (1, 2, 3, 4 ↓)



Use order of operation rules to **work out** the following problems, then round the answers as stated.

(19) $189 + 219 =$ _____ = _____ (2 s.f.)

(20) $50.00 - 12.85 =$ _____ = _____ (1 d.p.)

(21) $2.486 \div 2 =$ _____ = _____ (2 d.p.)

(22) $6342 \times 5 =$ _____ = _____ (2 s.f.)

(23) $2.368 + 3.73 =$ _____ = _____ (2 d.p.)

(24) $9000 - 4376 =$ _____ = _____ (2 s.f.)

(25) $2.486 \div 2 =$ _____ = _____ (1 d.p.)

(26) $0.0062 \times 4 =$ _____ = _____ (1 s.f.)

(27) $9.562 - 7.371 =$ _____ = _____ (2 d.p.)

(28) $56000 \times 8 =$ _____ = _____ (1 s.f.)

(29) The weight of some boxes are listed below.

Round each weight to 1 d.p. then work out the approximate total weight of these boxes.



2.36kg, 9.21kg,
15.46kg, 8.25kg,
3.89kg, 6.45kg

(30) A transport company records the kms covered by one of its trucks, as shown below.

Round each distance to 1 s.f. then work out the approximate total distance covered.



265km, 341km,
704km, 476km,
198km, 534km

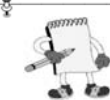
(31) Here is Karen's shopping receipt.

Round each amount to 1 s.f. then work out the estimated total cost.



\$3.85, \$12.70
\$19.50, \$6.25
\$52.60, \$104.95
\$3.95, \$29.65

The aim of this activity sheet is to look at two different ways of rounding numbers and apply these rounding techniques to work out estimated answers.



Suggested extension activity:

Make up similar questions as on this worksheet. Ask your child to round the numbers using both methods - decimal places and significant figures.

Example: A piece of wood is 4.945m long. Round this length to 2 d.p. Two cities are 586km apart. Round this distance to 1 s.f.

Collect some supermarket shopping docket and ask your child to work out an approximate total, by rounding the prices to the nearest \$.

Sign when completed: _____

Round each number to 1, 2 and 3 decimal places.

	1 d.p.	2 d.p.	3 d.p.
(1) 2.3184	_____	_____	_____
(2) 56.4716	_____	_____	_____
(3) 0.9352	_____	_____	_____
(4) 485.3925	_____	_____	_____
(5) 3.91739	_____	_____	_____
(6) 1.40219	_____	_____	_____
(7) 0.0259	_____	_____	_____
(8) 0.9999	_____	_____	_____
(9) 243	_____	_____	_____

Numbers can be rounded to a certain number of **significant figures** (s.f.) to obtain an approximate answer.

When rounding a number to a certain number of significant figures, count the required number of digits from the first non-zero digit. If the next number is 5 or above, add 1 to the previous digit. If the next digit is below 5, leave it as it is. Remember to add the zeros needed to keep place values correct.

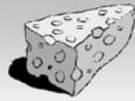
Examples: Round 3456 to 2 s.f. and 0.00048 to 1 s.f.

Answers: 3500 (2 s.f.) & 0.0005 (1 s.f.)

Round each number to 1, 2 and 3 significant figures.

	1 s.f.	2 s.f.	3 s.f.
(10) 7826	_____	_____	_____
(11) 6.3753	_____	_____	_____
(12) 0.04268	_____	_____	_____
(13) 90634	_____	_____	_____
(14) 0.003759	_____	_____	_____
(15) 47	_____	_____	_____
(16) 0.248	_____	_____	_____
(17) 783.89	_____	_____	_____
(18) 0.46	_____	_____	_____

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) $\frac{3}{5}$ _____
 $4 \overline{) 1.000}$) _____
- (2) $\frac{7}{8}$ _____ (4) $\frac{2}{3}$ _____
) _____) _____

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 $\frac{25}{100} = \frac{5}{20} = \frac{1}{4}$



Convert these decimals to fractions. Simplify.

- (5) 0.2 _____ (10) 0.8 _____
 (6) 0.35 _____ (11) 0.05 _____
 (7) 0.6 _____ (12) 0.68 _____
 (8) 0.84 _____ (13) 0.27 _____
 (9) 0.06 _____ (14) 1.5 _____

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.

- (15) 0.4 _____ % (20) 0.02 _____ %
 (16) 0.95 _____ % (21) 1.35 _____ %
 (17) 0.06 _____ % (22) 0.26 _____ %
 (18) 0.52 _____ % (23) 2.04 _____ %
 (19) 0.9 _____ % (24) 0.005 _____ %

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.

- (25) 25% _____ (30) 2.5% _____
 (26) 40% _____ (31) 125% _____
 (27) 72% _____ (32) 9% _____
 (28) 6% _____ (33) 60% _____
 (29) 85% _____ (34) 0.8% _____

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.

- (35) 75% _____ (40) 4.5% _____
 (36) 60% _____ (41) 125% _____
 (37) 42% _____ (42) 5% _____
 (38) 8% _____ (43) 90% _____
 (39) 35% _____ (44) 0.5% _____

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



fraction	decimal	percentage
(45)	\leftrightarrow (46)	\leftrightarrow 50%
$\frac{3}{4}$	\leftrightarrow (47)	\leftrightarrow (48)
(49)	\leftrightarrow 0.25	\leftrightarrow (50)
(51)	\leftrightarrow (52)	\leftrightarrow $66\frac{2}{3}\%$
(53)	\leftrightarrow 0.8	\leftrightarrow (54)
$\frac{1}{3}$	\leftrightarrow (55)	\leftrightarrow (56)



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: _____

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



An **equivalent fraction** can be created by either multiplying or dividing the top and bottom numbers of a fraction by the same number.

Examples: $\frac{1}{3} \times \frac{4}{4} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$
 $\frac{15}{20} \div \frac{5}{5} = \frac{15 \div 5}{20 \div 5} = \frac{3}{4}$



(18) On 10 days during the past 4 weeks it has been raining. Write this as a fraction, then simplify your answer.



(19) 20 out of 95 apples were rotten. Write this as a fraction, then simplify your answer.



Create **equivalent** fractions by either **multiplying** or **dividing** each fraction by the numbers given.

(1) $\frac{1}{2} \times \frac{5}{5} = \frac{1 \times 5}{2 \times 5} =$ _____

(2) $\frac{20}{50} \div \frac{10}{10} = \frac{20 \div 10}{50 \div 10} =$ _____

(3) $\frac{2}{3} \times \frac{8}{8} = \frac{x}{x} =$ _____

(4) $\frac{24}{64} \div \frac{8}{8} = \frac{\div}{\div} =$ _____

(5) $\frac{4}{5} \times \frac{9}{9} = \frac{x}{x} =$ _____

(6) $\frac{63}{84} \div \frac{7}{7} = \frac{\div}{\div} =$ _____

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.

(7) $\frac{25}{40} =$ _____ (12) $\frac{75}{95} =$ _____

(8) $\frac{24}{32} =$ _____ (13) $\frac{45}{108} =$ _____

(9) $\frac{42}{54} =$ _____ (14) $\frac{36}{54} =$ _____

(10) $\frac{24}{40} =$ _____ (15) $\frac{57}{100} =$ _____

(11) $\frac{49}{84} =$ _____ (16) $\frac{65}{200} =$ _____

(17) 5 out of 25 people went to the movies. Write this as a fraction, then simplify your answer.



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



Write these improper fractions as mixed numbers.

(20) $\frac{19}{2} =$ _____ (25) $\frac{47}{5} =$ _____

(21) $\frac{28}{3} =$ _____ (26) $\frac{68}{6} =$ _____

(22) $\frac{19}{4} =$ _____ (27) $\frac{75}{7} =$ _____

(23) $\frac{23}{5} =$ _____ (28) $\frac{85}{8} =$ _____

(24) $\frac{29}{6} =$ _____ (29) $\frac{75}{9} =$ _____

Write these mixed numbers as improper fractions.

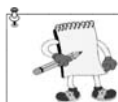
(30) $6\frac{1}{4} =$ _____ (35) $4\frac{7}{8} =$ _____

(31) $7\frac{2}{3} =$ _____ (36) $6\frac{3}{4} =$ _____

(32) $4\frac{3}{5} =$ _____ (37) $8\frac{5}{9} =$ _____

(33) $8\frac{5}{6} =$ _____ (38) $7\frac{6}{7} =$ _____

(34) $5\frac{5}{9} =$ _____ (39) $8\frac{2}{3} =$ _____



The aim of this activity sheet is to understand how to create equivalent fractions, simplify fractions and convert between improper fractions and mixed numbers.

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: $\frac{20}{40} = \frac{1}{2}$

Create improper fractions or mixed numbers and ask your child to convert between both forms.

Sign when completed:

"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 $\frac{3}{5}$ of 80 = _____

(2) Find $\frac{3}{4}$ of 96 = _____

(3) Find $\frac{4}{7}$ of 98 = _____

(4) Find $\frac{5}{8}$ of \$72 = _____

(5) Find $\frac{7}{9}$ of \$10.80 = _____

(6) Andy is $\frac{2}{3}$ of the way through a cross-country race. If the race is 9000m long, how far has he run so far?

$9000 \div \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

(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?

$60 \div \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

(8) A café has sold $\frac{5}{8}$ of the salad rolls available for sale that day. If there are 136 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) Alex has read 64 pages or $\frac{1}{3}$ of his book. How many pages in this book?



(10) Zoe has covered 12km or $\frac{1}{5}$ of her bike ride. How far does she plan to ride?



(11) Evan scored 32 runs or $\frac{1}{8}$ of the team total. How many runs did the team score?



(12) Jackie spent \$7.20 or $\frac{2}{9}$ of her money. How much money did she originally have?



To add or subtract fractions the denominators (bottom numbers) must be the same, then add or subtract the numerators (top numbers).

Examples: $\frac{2}{3} + \frac{3}{4} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12}$

$\frac{4}{5} - \frac{2}{3} = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$

If the answer is an improper fraction, it can be converted to a mixed number, as above.

When subtracting, it may be necessary to convert a mixed number to an improper fraction before subtracting.

Example: $5\frac{1}{4} - 3\frac{3}{4} = \frac{21}{4} - \frac{15}{4} = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$

Add and subtract these fractions. Simplify your answers.

(13) $\frac{7}{9} + \frac{5}{9} =$ _____

(14) $\frac{2}{3} + \frac{3}{5} =$ _____

(15) $\frac{4}{5} + \frac{3}{4} =$ _____

(16) $3\frac{1}{2} + 4\frac{2}{3} =$ _____

(17) $5\frac{3}{6} + 2\frac{1}{4} =$ _____

(18) $\frac{7}{8} - \frac{3}{4} =$ _____

(19) $\frac{3}{4} - \frac{2}{5} =$ _____

(20) $4\frac{4}{5} - 2\frac{2}{3} =$ _____

(21) $7\frac{1}{3} - 5\frac{3}{4} =$ _____

(22) Two pieces of wood are $6\frac{2}{5}$ metres and $4\frac{3}{4}$ metres long. What is the combined length?

(23) A piece of wood $10\frac{3}{4}$ metres long is to have a piece $6\frac{4}{5}$ metres long cut off one end. How long is the piece that is left?



The aim of this activity sheet is to revise calculations involving fractions, find a whole number given a fraction and add & subtract fractions.

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?

Karen ate $\frac{1}{4}$ of one pizza and $\frac{1}{3}$ of a second pizza. How much pizza has she eaten altogether?

Sign when completed: _____

Finding a percentage of a quantity can be done several ways.

Example: Find 30% of \$120

Possible methods:

- (1) As 10% of \$120 = \$12, 30% would be $3 \times \$12 = \36 .
- (2) As $30\% = 0.3$, $\$120 \times 0.3 = \36 .
- (3) As $30\% = \frac{3}{10}$, $\$120 \times \frac{3}{10} = \frac{360}{10} = \36 .

Can you think of other ways?



Increasing and decreasing by a given percentage.

Example: If a book costs \$16.00 plus a 40% mark-up, what is the selling price?

Answer: $\$16 \times 40\% = \6.40 , $\$16.00 + \$6.40 = \$22.40$

Example: An \$850 bike is to be discounted by 20%. What is the discounted price?

Answer: $\$850 \times 20\% = \170 , $\$850 - \$170 = \$680$



Increase or decrease these numbers as indicated.

(12) Increase 68 by 25% _____

(13) Decrease 200 by 40% _____

(14) Increase 75 by 150% _____

(15) Decrease 150 by $66\frac{2}{3}\%$ _____

The Goods and Services Tax (GST) is 12.5%. Work out the selling price for these items after GST has been added.

(16) Walkman: Price = \$16 + GST _____



(17) Printer: Price = \$120 + GST _____



A sports shop is having a sale. Work out the new prices after a $33\frac{1}{3}\%$ discount has been taken off.

(18) Roller blades: Price = \$195.00 _____



(19) Treadmill: Price = \$954.00 _____



Work out each percentage of these numbers.

(1) Find 20% of 90 = _____

(2) Find 80% of 140 = _____

(3) Find $66\frac{2}{3}\%$ of 150 = _____

(4) Find $33\frac{1}{3}\%$ of 24.6 = _____

(5) Find 75% of 1.08 = _____

(6) Andy is 50% of the way through a cross-country race. If the race is 9000m long, how far has he run so far?



(7) Room 9 pupils are 75% of the way through a 60 minute game of soccer. For how long have they been playing?



(8) A cafe has sold 20% of the salad rolls available for sale that day. If there are 135 salad rolls available, how many has the cafe sold so far?



Find a whole, given a percentage.

Six or 20% of the Room 7 pupils went to the movies. How many pupils in Room 7?

Answer: $20\% = \frac{1}{5}$, if $\frac{1}{5} = 6$, then $5 \times 6 = 30$ pupils



(9) Ali has read 64 pages or $33\frac{1}{3}\%$ of his book. How many pages in this book?



(10) Zoe has covered 12km or 25% of her bike ride. How far does she plan to ride?



(11) Evan scored 126 runs or 70% of the team total. How many runs did the team score?



The aim of this activity sheet is to revise calculations involving percentages, find a whole number given a percentage and \uparrow & \downarrow a number by a given percentage.

Suggested extension activity:

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

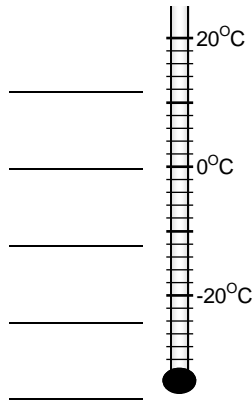
Example: Your pocket money each week is \$10. If you save 20% of your pocket money, how much do you save?

Jacob bought some new clothes worth \$120 and received a 10% discount. How much did he pay for the clothes?

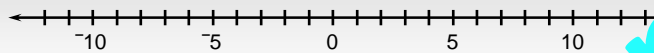
Sign when completed: _____

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

- (1) Start at 17°C drop 14°C _____
- (2) Start at 0°C rise 15°C _____
- (3) Start at 14°C drop 18°C _____
- (4) Start at -9°C rise 12°C _____
- (5) Start at -3°C drop 15°C _____



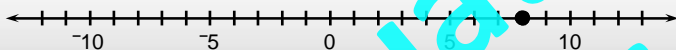
Positive and negative numbers are called **integers**. Integers can be represented on a number line. A number line goes on forever, in both directions. *Example:*



A number line can be used to add positive and negative numbers together.

Examples:

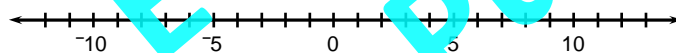
$$8 + -12 = -4$$



$$-9 + 14 = 5$$



Use the number line to **add** or **subtract** these integers.



- (6) $12 + -7 =$ _____ (11) $-1 - 8 =$ _____
- (7) $-11 + 8 =$ _____ (12) $0 - -9 =$ _____
- (8) $7 + -12 =$ _____ (13) $-12 - -17 =$ _____
- (9) $-5 + -6 =$ _____ (14) $-3 - 9 =$ _____
- (10) $-7 + -3 =$ _____ (15) $-11 - -7 =$ _____

Add or subtract these larger integers.

- (16) $42 + -27 =$ _____ (21) $-62 - 78 =$ _____
- (17) $-78 + 53 =$ _____ (22) $31 - -45 =$ _____
- (18) $64 + -85 =$ _____ (23) $-60 - -89 =$ _____
- (19) $-45 + -26 =$ _____ (24) $-23 - 47 =$ _____
- (20) $-64 + -57 =$ _____ (25) $-38 - -72 =$ _____

In a game with two dice, the two numbers that appear are added together. *Example:* $6 + 1 = 7$

Odd totals are **negative** and **even** totals are **positive**. **Work out** the final total if these totals were thrown.

- (26) 9, 10, 3, 6, 11, 7 _____
- (27) 8, 11, 9, 4, 2, 5 _____
- (28) 3, 8, 11, 10, 7, 4 _____
- (29) 7, 5, 8, 9, 6, 10 _____
- (30) 4, 9, 5, 7, 10, 2 _____



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



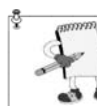
(31) Below are James' details showing the withdrawals from his bank account and deposits into his bank account for the month of December.

The opening balance was \$152.60.



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

Date	Detail	Withdrawal	Deposits	Balance
1/12	Opening balance			\$152.60
5/12	birthday present	25.80		
9/12	repairs to car	195.90		
11/12	movies	8.50		
16/12	wages		219.40	
19/12	Christmas presents	105.30		
23/12	groceries	77.65		
24/12	Closing balance			



The aim of this activity sheet is to understand that positive and negative numbers go on for ever and are called integers.

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 \$80 in an account and spent \$115, what is the new balance of your account? Also do the reverse start with -\$90, add \$37 to your account ... what is the new balance?

Sign when completed: _____

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

$$10^1 = 10, 10^2 = 100, 10^3 = 1000, 10^4 = 10000, \text{ etc.}$$

$$10^{-1} = 0.1, 10^{-2} = 0.01, 10^{-3} = 0.001, \text{ etc.}$$

To multiply by a power of 10 is not as difficult as it might seem.

Examples: $3.5 \times 10000 = 35000$, $29.7 \times 100 = 2970$,
 $915.4 \times 0.01 = 9.154$, $7.6 \times 0.0001 = 0.00076$

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



Work out the following.

- (1) $5.3 \times 100 =$ _____
- (2) $2.7 \times 10000 =$ _____
- (3) $9.185 \times 1000000 =$ _____
- (4) $0.26 \times 10^3 =$ _____
- (5) $25.3 \times 0.000001 =$ _____
- (6) $2.1 \times 0.001 =$ _____
- (7) $7806.1 \times 0.00001 =$ _____
- (8) $143.9 \times 10^{-4} =$ _____

Numbers written in **standard form** have two parts, ... a **decimal number**, with just ONE non-zero number before the decimal point and ... a **power of 10**.

Examples: 1.4×10^4 , 3.9×10^7 , 9.6×10^{-3} , 2.5×10^{-9}

Write these standard form numbers as whole numbers or decimals.



Answers:

14000, 39000000, 0.0096 & 0.000025

- (9) These standard form numbers have been converted to ordinary numbers.
 $9.7 \times 10^8 = 970000000$ & $230000 = 2.3 \times 10^5$
 $2.1 \times 10^{-4} = 0.00021$ & $0.00000045 = 4.5 \times 10^{-7}$

Describe the relationship between the standard form power of 10 and the moving of the decimal point in the whole number or decimal.

Complete this table by converting between standard form and ordinary numbers.



	Standard Form ⇔	Whole number or decimal
	3.9×10^7	⇔ (10)
(11)		⇔ 7800000000
	2.1×10^{-3}	⇔ (12)
(13)		⇔ 0.000034
	8.75×10^8	⇔ (14)
(15)		⇔ 5620000
	4.37×10^{-6}	⇔ (16)
(17)		⇔ 0.000000689
	9.014×10^6	⇔ (18)
(19)		⇔ 0.000000000523

- (20) An aeroplane has traveled approximately 2.3×10^8 kilometres in the past two days.
Write this distance as an ordinary number.

- (21) A train travels 48300km per year.
Write this distance in standard form.

- (22) In a bottling plant, a machine can fill jars at the rate of 3 per minute. The machine runs for 8 hours per day, 7 days a week.
Work out how many jars can be filled in 1 day, 1 and 25 weeks.
Write your answers as ordinary numbers and in standard form.

1 day: _____

1 week: _____

25 weeks: _____

The aim of this activity sheet is to understand how to multiply by powers of 10 and convert between standard form and ordinary numbers.

Suggested extension activity:

Make up similar number and word questions as on this worksheet that involve multiplying by powers of 10 and converting between the two number forms.

Example: At the TWO Dollar Shop, a small toy costs the owner 35 cents to purchase. What is the cost (in dollars) of 10^4 toys?

4.5×10^3 km is the same as how many kilometres (ordinary number)?

Sign when completed: _____

Using a **ratio** is one way of describing how often something has happened and compares quantities of the same kind.

Example: There are 18 girls and 12 boys in Rm 9.

This statement can be written as a ratio **18:12**.

Write these statements as ratios.

There are 11 cars and 5 trucks in the car park.

Sam has 3 cats, 1 dog and 6 birds as pets.

Answers: 11:5 & 3:1:6

Ratios can be **simplified**, just like fractions.

Example: 40:50 = 4:5, 64:24 = 8:3



Simplify these ratios.

(1) 8:10 = ____:____ (6) 56:96 = ____:____

(2) 12:4 = ____:____ (7) 65:45 = ____:____

(3) 30:15 = ____:____ (8) 105:30 = ____:____

(4) 28:54 = ____:____ (9) 6:9:3 = ____:____:____

(5) 63:18 = ____:____ (10) 8:2:10 = ____:____:____

Write the information in each sentence as a **ratio**, then **simplify** the ratio if possible.

(11) At the movies there were 56 children and 15 adults.



(12) At a rugby game, 5400 supported one team and 3200 supported the other.



(13) It rained two days last week. **Write** the ratio of fine days to wet days for last week.

Quantities can be **shared** by a given **ratio**.

Example: A cake was cut into 12 pieces and shared in a ratio of 1:3 between two friends.

How many pieces does each friend get?

Answer:

Add the ratio numbers. (1 + 3 = 4)

Divide the quantity being shared by this answer. (12 ÷ 4 = 3)

Multiply each ratio number by this answer. (3 × 1 = 3, 3 × 3 = 9)

One friend get 3 pieces and the other gets 9 pieces.



Share these quantities by the given ratios.

(14) Share \$60 in a ratio of 2:3 _____:_____

(15) Divide 117kg in a ratio of 7:2 _____:_____

(16) Share \$99 in a ratio of 5:6 _____:_____

(17) Divide 60L in a ratio of 5:3 _____:_____

(18) Share \$117 in a ratio of 6:7 _____:_____

(19) Share \$400 in a ratio of 9:11 _____:_____

(20) Two charities raised \$17505 in a combined garage sale. If the money is to be divided in a ratio of 4:5, how much does each charity receive?



A **rate** compares two quantities of a different kind.

Example: A car travelled at 80km per hr

Meat costs \$10.95 per kg.

Milk costs \$2.95 per litre.

A **rate** can be worked out if you know the two quantities.

Example: Sam rides his bike for 2 hours and covers 32 kilometres. What is his average speed? (16km/hr)



Work out these rate problems.

(21) At the supermarket, apples cost \$3.50 per kg. How much does it cost to buy 2kg? _____



How many kilograms of apples do you get for \$1.90? _____

(22) Petrol costs \$2.10 per litre. How much does it cost to buy 35 litres? _____



How many litres of petrol do you get for \$52.50? _____

(23) Pete drives his car at 95 km/hr. How far does he travel in 3 hours at this speed? _____



For how long had he been driving if he covered 142.5km? _____

(24) Grapes are on special for \$4.90 per kg. How much does it cost to buy 1.75 kgs? _____



How many kilograms of grapes can you buy for \$12.25? _____



The aim of this activity sheet is to understand how to create & simplify ratios and divide a quantity by a ratio. Also understand how rates are created and used.

Suggested extension activity:

Using money totals and creating similar questions as on this sheet, ask your child to divide the money total using various ratios.

Example: Share \$66 in a ratio of 5:6. Divide 240kg in a ratio of 2:3:5. If meat costs \$14.95 per kg, how much does 0.5kg cost?

Sign when completed: _____

As people enter a party, they are given a spot prize ticket numbered from 1 to 60.



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
51	52	53	54	55	56	57	58	59	60

Alex's lucky number is 3, so he started with the 3rd person who got the first spot prize. He then selects every 6th 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 piece of fish costs \$1.95.
Work out the number sequence that shows the cost of buying 1, 2, 3, 4 and 5 pieces of fish.



(5) How many pieces of fish can you buy with \$13.65? _____

(6) How many pieces of fish can you buy with \$21.45? _____

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 5, then subtract 4' to create the first 4 terms of the number sequence.

Answers:
 1st term: $1 \times 5 - 4 = 1$
 2nd term: $2 \times 5 - 4 = 6$
 3rd term: $3 \times 5 - 4 = 11$
 4th term: $4 \times 5 - 4 = 16$
 The first 4 terms in this sequence are 1, 6, 11 & 16.



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

(7) **Rule = Multiply by 2, then add 3**

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

(8) **Rule = Multiply by 3, then subtract 2**

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

(9) **Rule = Multiply by 6, then add 5**

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

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

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: $S = 4n - 3$**

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

(12) **Rule: $S = 15 - 5n$**

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

(13) **Rule: $S = 8n + 3$**

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

(14) **Rule: $S = 2n - 7$**

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

(15) A number sequence is created using the rule ...
 $S = 7n - 13$
 Find the following terms in this sequence.
 6th term: _____
 18th term: _____
 32th term: _____
 100th term: _____

(16) What term (n) in the sequence has a value of 435? _____

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: _____

An **algebraic term** is made up of numbers (coefficients), letters (variables) and powers (exponents).

Example: $9a^3b$ 9 is the coefficient
'a' and 'b' are the variables
3 is the exponent



Like terms have the same variables and exponents.

Example: $4y^2, -6y^2, 10y^2$ are like terms,
but $5y, 7y^3, -3y^2$ are not like terms.

An **algebraic expression** is a group of algebraic terms.

Example: $2ab^3 + 7b^3$ and $-6y^3 + 7y^2 + 2y + 8$

Only **like terms** can be added and subtracted when simplifying algebraic expressions.

Example: $4k^3 + 5k^3 = 9k^3$

Removing the brackets from an algebraic expression is called **expanding**.

Example: Expand $2(a + 5)$ and $5(3c - 4)$

Answers: $2 \times a + 2 \times 5 = 2a + 10$
 $5 \times 3c - 5 \times 4 = 15c - 20$



Expand these algebraic expressions.

- (16) $7(a + 8)$ _____
- (17) $4(b - 10)$ _____
- (18) $3(4c + 7)$ _____
- (19) $5(5d - 9)$ _____
- (20) $7(6 - 3e)$ _____

Expand these algebraic expressions, then **simplify** by collecting like terms.

- (21) $3(f + 5) + 11$ _____
- (22) $7(g - 6) + 14$ _____
- (23) $13 + 4(2h - 5)$ _____
- (24) $7(m + 3) + 5(m - 9)$ _____
- (25) $2(4k + 3) - 3(2k + 9)$ _____

Factorising an algebraic expression is the opposite of expanding.

Example: Factorise $8a + 12$ and $9d - 15$

Answers: $4 \times 2a + 4 \times 3 = 4(2a + 3)$
 $3 \times 3d - 3 \times 5 = 3(3d - 5)$



Factorise these algebraic expressions.

- (26) $8a + 56$ _____
- (27) $7b - 28$ _____
- (28) $6c + 54$ _____
- (29) $6e + 10$ _____
- (30) $5f + 20g + 40$ _____
- (31) $12h^2 + 10h$ _____

The aim of this activity sheet is to work with algebraic terms involving simplifying by collecting like terms, expanding and factorizing.

Suggested extension activity:
Make up similar questions as on this worksheet and ask your child to simplify by collecting like terms. This can be done using objects first before you work with algebraic terms.
Make up similar questions as above to revise expanding and factorising algebraic expressions.

Sign when completed: _____

Look at the fish shapes in these boxes.

Box 1	Box 2	Box 3

(1) How many of each fish shape in each box?

Box 1: = _____, = _____, = _____

Box 2: = _____, = _____, = _____

Box 3: = _____, = _____, = _____

(2) How many of each fish shapes altogether?

Total: = _____, = _____, = _____

Simplify these algebraic expressions by collecting like terms.



- (3) $6a + 7a$ _____
- (4) $12b - 9b + 5b$ _____
- (5) $8ab + 6a - 5ab$ _____
- (6) $7f + 5g + 9g - 5f$ _____
- (7) $8m - 6n + 5m + 2n$ _____
- (8) $12p + 9q + 7q - 13p$ _____
- (9) $8e + 9ef - 8ef$ _____
- (10) $8e^2 + 9e^2f - 8e^2f$ _____
- (11) $2c + 8c^2 - 5c^2$ _____
- (12) $11e^2 - 15e^2$ _____
- (13) $12g^2 - 7g^2 + 8g^2f$ _____
- (14) $11d^2e - 9de^2 + 5d^2e$ _____
- (15) $14w^2 + 9w^2v - 8wv^2$ _____

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

Examples:

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

$$7c = 56 \text{ (where } 7c \text{ means } 7 \times c)$$

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



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



(1) $a + 47 = 131$ $a =$ _____

(2) $b - 63 = 102$ $b =$ _____

(3) $7c = 490$ $c =$ _____

(4) $40d = 640$ $d =$ _____

Using **opposite operations** to solve equations.

Examples:



$$a + 5 = 23$$

$$a + 5 - 5 = 23 - 5$$

$$a = 18$$

$$3b - 8 = 31$$

$$3b - 8 + 8 = 31 + 8$$

$$3b = 39$$

$$3b \div 3 = 39 \div 3$$

$$b = 13$$

Solve these equations using opposite operations and show your working. Leave answers as mixed numbers.

(5) $e + 15 = 51$ (8) $7h - 78 = -19$

$e =$ _____

$h =$ _____

(6) $6f + 13 = 99$ (9) $9g + 69 = 75$

$f =$ _____

$g =$ _____

(7) $8g - 48 = 19$ (10) $4f + 82 = 15$

$g =$ _____

$f =$ _____

Some equations involve a combination of algebraic skills to solve.

Examples:

$$4(c + 5) = 39$$

$$4c + 20 = 39$$

$$4c + 20 - 20 = 39 - 20$$

$$4c = 19$$

$$4c \div 4 = 19 \div 4$$

$$c = 4\frac{3}{4}$$

$$2(d - 5) = 47$$

$$2d - 10 = 47$$

$$2d - 10 + 10 = 47 + 10$$

$$2d = 57$$

$$2d \div 2 = 57 \div 2$$

$$d = 28\frac{1}{2}$$



Solve these equations and show your working. Round your answers to 2 d.p.

(11) $6(k + 3) = 41$ (12) $8(g - 6) = 37$

$k =$ _____

$g =$ _____

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

working space

(13) $6(k - 3) = 37$ $k =$ _____

(14) $401 - m = 95$ $m =$ _____

(15) $9d + 27 = 111$ $d =$ _____

(16) $7(b + 5) = 80$ $b =$ _____

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



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

(17) Sam ran 6 even paced laps around a local park, but did stop during one lap for 21 minutes to talk to a friend. If he was out for 1 hr 19 min 30 sec, including the stop, how long does it take Sam to complete each lap?

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 x / ÷ 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: _____

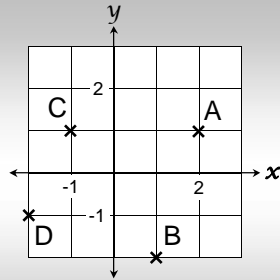
To locate an exact point on a graph, **co-ordinates** are used.

Example: A = (2,1) B = (1,-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 & D? Answers: (-1,1) & (-2,-1)



The ordered pairs for a **linear graph**

can be created by a rule or **linear equation**.

Example: $y = 2x + 1$

By substituting values for x into the linear equation, y values can be worked out for each ordered pair.

Example: If $x = -1$, then $y = 2(-1) + 1 \Rightarrow y = -2 + 1 = -1$

The ordered pair would be (-1,-1).

If $x = 0$ & 4, work out the two ordered pairs.

Answers: (0,1) & (4,9)



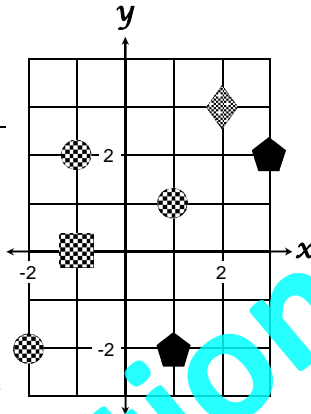
(1) What shape is at the point (2,3)?

(2) Write the co-ordinates to locate all the shapes.

squares _____

circles _____

pentagons _____



(3) Plot and label the points A to F on the graph below.

A = (3,2)

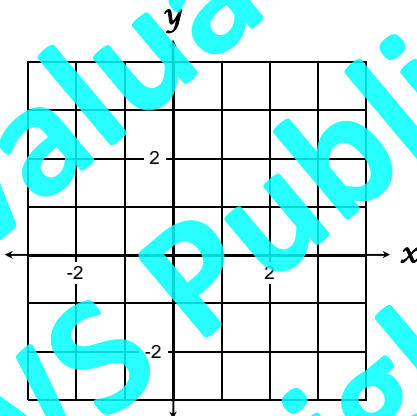
B = (-2,3)

C = (2,0)

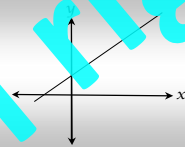
D = (0,1)

E = (3,-2)

F = (-2,-1)

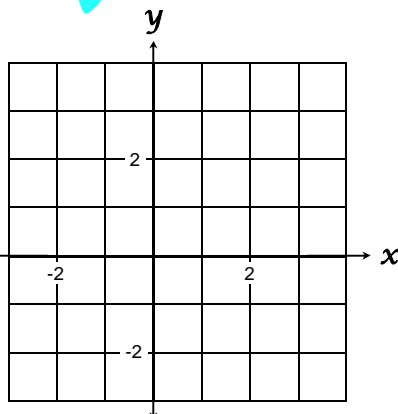


When a set of **ordered-pairs** or **co-ordinates** are plotted and when joined form a straight line, it is called a **linear graph**.



(4) Plot and join the points (x,y) in this table.

x	y
-2	0
0	1
2	2
4	3



(5) Are your points in a straight line?

Work out the **y values** for each group of ordered pairs for these three linear equations (straight line graphs).

(6) Line A: $y = 2x$

(-1, _____), (0, _____), (1, _____), (2, _____), (3, _____)

(7) Line B: $y = 2x - 1$

(-1, _____), (0, _____), (1, _____), (2, _____), (3, _____)

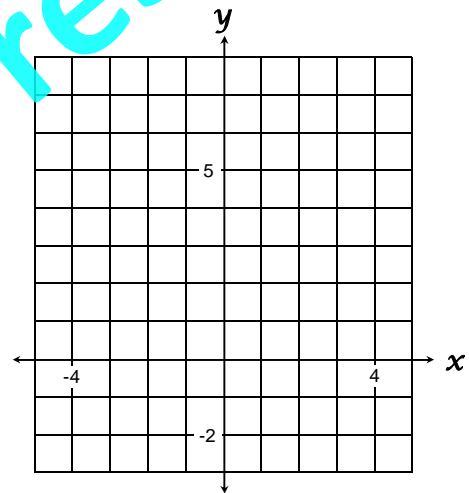
(8) Line C: $y = 2x + 3$

(-2, _____), (-1, _____), (0, _____), (1, _____), (2, _____)

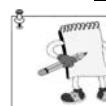
(9) Line D: $y = \frac{1}{2}x + 1$

(-4, _____), (-2, _____), (0, _____), (2, _____), (4, _____)

(10) Plot and label the four lines on the graph below.



(11) Which lines have the same slope?



The aim of this activity sheet is to use the co-ordinate system for locating & plotting points on a graph.
Note: Order is important (x,y) or (across, up/down).

Suggested extension activity:

Make up similar questions as on this worksheet involving ordered pairs and ask your child to plot each set of points on a new graph.

Create some linear equations and ask your child to create some ordered-pairs that they can plot. When the plots are joined, it should create a straight line.

Sign when completed:

The basic units of the metric system are the **metre**, the **gram** and the **litre**.



What can you measure with each unit?

Answer: Use metres to measure **length**, grams to measure **mass** (weight) and litres to measure **capacity** (volume).

Larger and smaller units are all based on multiples of 10, such as kilometre, centimetre and millimetre, etc.

How much larger or smaller is each unit compared with the basic unit? Fill in the missing numbers.

kilometre	(1) _____ times longer than a metre
metre	standard unit for length
centimetre	(2) _____ times shorter than a metre
millimetre	(3) _____ times shorter than a metre
tonne	(4) _____ times heavier than a kilogram
kilogram	(5) _____ times heavier than a gram
gram	standard unit for weight
milligram	(6) _____ times lighter than a gram
kilolitre	(7) _____ times more volume than a litre
litre	standard unit for volume
millilitre	(8) _____ times less volume than a litre

Using each of the above metric units **only once**, write the abbreviated metric unit/s that would be used to measure the following. *Example: metre = m*

- (9) The weight of a large truck. _____
- (10) The height of a tall tree. _____
- (11) The volume of a small cup. _____
- (12) The thickness of cardboard. _____
- (13) The capacity of a large bucket. _____
- (14) The weight of an apple. _____
- (15) The distance between two cities. _____
- (16) The thickness of a text book. _____

Converting between metric units.

- | | |
|-----------------------|-----------------------|
| (17) 2.5m = _____ mm | (22) 135cm = _____ mm |
| (18) 1250mm = _____ m | (23) 9650m = _____ km |
| (19) 7.2m = _____ cm | (24) 5.8km = _____ m |
| (20) 396cm = _____ m | (25) 3.2g = _____ mg |
| (21) 52mm = _____ cm | (26) 4250mg = _____ g |

More metric conversions.

- | | |
|-----------------------|------------------------|
| (27) 8100g = _____ kg | (31) 13.5L = _____ mL |
| (28) 0.5kg = _____ g | (32) 750mL = _____ L |
| (29) 9.1t = _____ kg | (33) 11470L = _____ kL |
| (30) 3950kg = _____ t | (34) 5.1kL = _____ L |

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

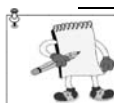
Example: Sam has two pieces of wood. One is 75cm long and the other is 2.9m long. What is the total length of wood in metres?

Answer: 0.75m + 2.9m = 3.65m



Answer these questions in the metric units stated.

- (35) $6.3g \div 9 = ?$ (answer in **milligrams**)
- (36) $900m + 4.8km + 870cm = ?$ (answer in **metres**)
- (37) $4500g - 3.9kg = ?$ (answer in **kilograms**)
- (38) $856m \times 9 = ?$ (answer in **kilometres**)
- (39) $132.7cm - 905mm = ?$ (answer in **millimetres**)
- (40) $5000mg + 8.7g + 0.53kg = ?$ (answer in **grams**)
- (41) $7865kg - 5.7t = ?$ (answer in **tonnes**)
- (42) $7280mL \div 8 = ?$ (answer in **litres**)
- (43) $0.85m + 264cm + 4100mm = ?$ (answer in **centimetres**)
- (44) $580L \times 6 = ?$ (answer in **kilolitres**)



The aim of this activity sheet is to revise the units of the metric system and to convert between the various units.

Suggested extension activity:

Ask your child to convert between different units as in Q17 to Q34 and add or subtract various metric measurements presented in different units, such as in Q35 to Q44. Make up words problems.

Example: From a 2.4m length of wood, 800cm is cut off. How long is the remaining piece of wood? An empty truck weighs 7.5t and when full it weighs 13.75t. What is the weight of the load? etc.

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.

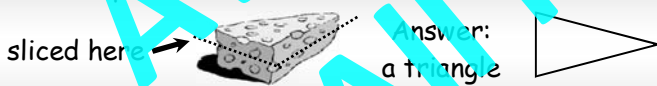
Example: A cylinder is based on a circle. If you stacked some 50c coins on top of each other, it would look like a cylinder.



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?

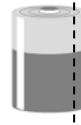


If you cut through an object, you see a **cross-section** of the object.

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 circle.



(21)



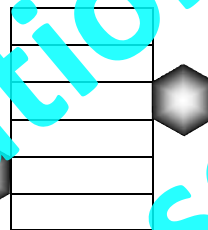
Draw a line on this 3D shape so that when it is cut, the cross-sectional 2D shape created would be a triangle.

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.

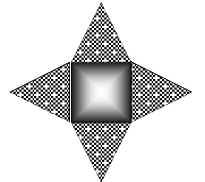
(22)



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)

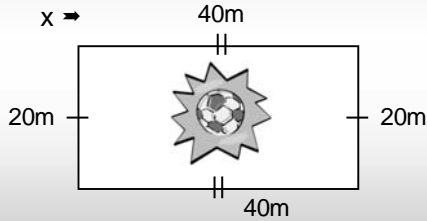
Sign when completed: _____

Distance around the outside.

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

Example:

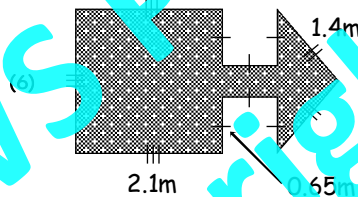
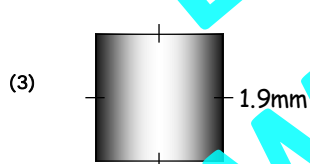
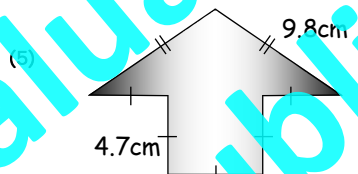
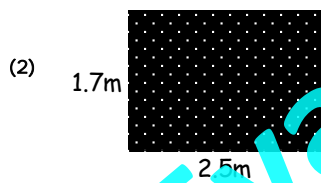
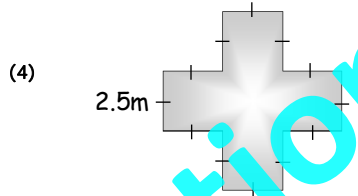
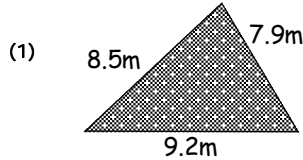
Add the length of ALL sides.



Answer: 120m

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.



(7) If the perimeter of a square is 48m, how long is each side?

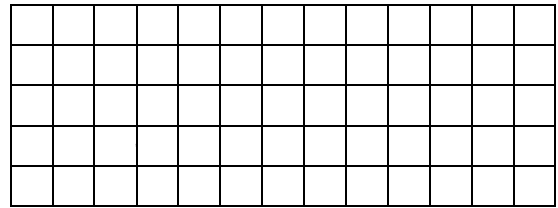
(8) If a perfect hexagon has a perimeter of 72m, how long is each side?

(9) A rectangle has a perimeter of 56cm. If the short side is 11cm, how long is the other side?

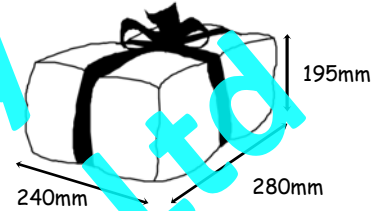
(10) A rectangle has a perimeter of 90cm. What are the side lengths, if the long side is twice as long as the short side?

(11) On the grid below, shade in squares to create an H shaped courtyard design that has a perimeter of exactly 30 metres.

Note: The squares are 1 metre squares.



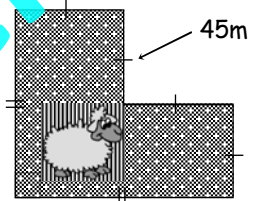
This parcel is to be held together with a colourful ribbon.



(12) **Work out** the length of ribbon that is needed to go around the parcel, then add 650mm to allow for a bow to be tied.

(13) If the ribbon costs \$0.75 per metre, **work out** the cost of the ribbon required.

This paddock is to have a four wire fence built around the outside.



(14) **Work out** the perimeter of this paddock.

(15) **Work out** the length of wire needed to build the fence.

(16) Wire comes in 50m rolls at \$65.20 each. How many rolls are needed to fence this paddock and what is the total cost?

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:

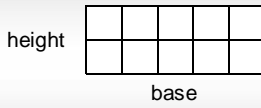
Find some shapes around your house, for which you can work out the perimeter.

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?

Answer: 10 square units ($2 \times 5 = 10$ square units)

Area of a rectangle or square = bh



Work out the area or the length of the missing side for these shapes.



(9) What is the area of a rectangle with sides of 4.5 centimetres and 9 centimetres?

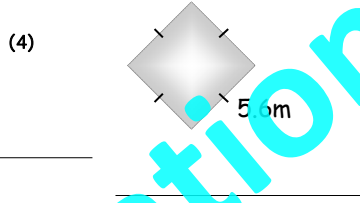
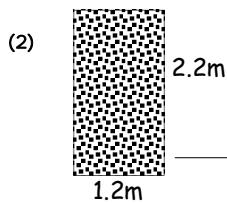
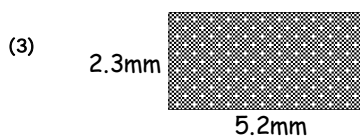
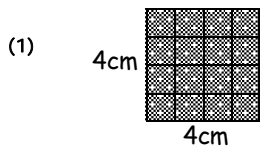
(10) What is the area of a triangle with a base of 7mm and a height of 12 mm?

(11) If a square has an area of 81cm^2 , how long is each side of the square?

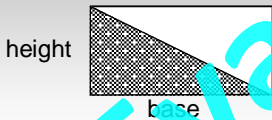
(12) If the area of a triangle is 108cm^2 and the height is 12cm, what is the base of the triangle?

Work out the area of each rectangle or square.

(The units for the answers will be mm^2 , cm^2 or m^2 .)

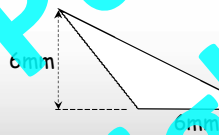
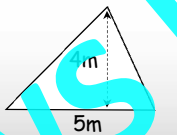
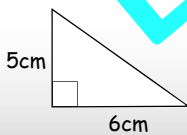


This rectangle has been cut in half. The area of a triangle created will be half that of the rectangle.



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

Example: Find the area of these triangles.

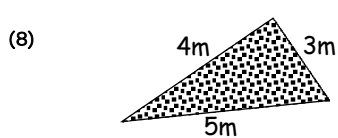
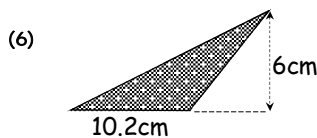
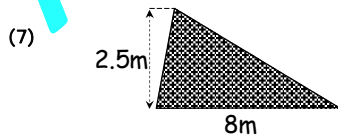
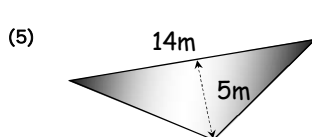


Answers: $A = \frac{1}{2} \times 6 \times 5 = 15\text{cm}^2$ $A = \frac{1}{2} \times 5 \times 4 = 10\text{m}^2$ $A = \frac{1}{2} \times 6 \times 6 = 18\text{mm}^2$

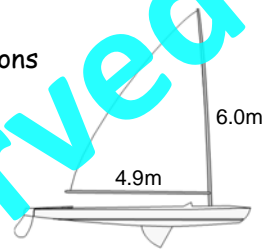
Note: The base and height always intersect at right angles.

Work out the area of each triangle.

(The units for the answers will be mm^2 , cm^2 or m^2 .)



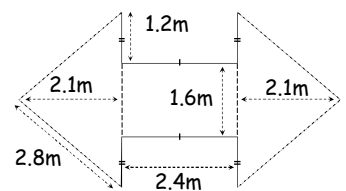
This diagram shows the dimensions of a triangular sail for a yacht.



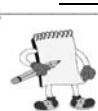
(13) Work out the area of this sail.

(14) If sail cloth cost \$375.50 per m^2 , 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 revise area and to use various formulae to work out the area of squares, rectangles and triangles.

Suggested extension activity:

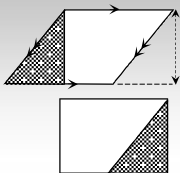
Find square or rectangular shaped objects around the house that can be measured. Ask your child to measure the 'base' and 'height' (or 'width') of these objects and work out their areas.

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

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

Sign when completed:

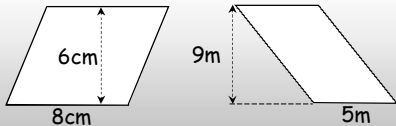
A **parallelogram** has two pairs of parallel sides.



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

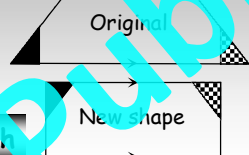
Note: The base (b) and height (h) always intersect at right angles.

Work out the area of each parallelogram.

- (1) (2)
- (3) (4)

A **trapezium** has one pair of parallel sides.

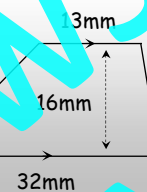
A triangular shape is cut off each end and can be moved to form a square or rectangle.



Area of a trapezium = $\frac{1}{2}(a + b)h$

Note: 'h' is always the distance between the parallel sides. 'a' and 'b' are the lengths of the two parallel sides.

Example: Find the area of this trapezium.



Answer:
 $A = \frac{1}{2}(3 + 32)16$
 $A = \frac{1}{2}(45)16$
 $A = 360\text{mm}^2$

Work out the area of each trapezium.

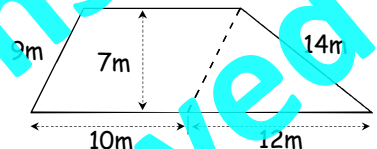
- (5) (6)
- (7) (8)

Work out the area or the length of the missing side for these shapes.

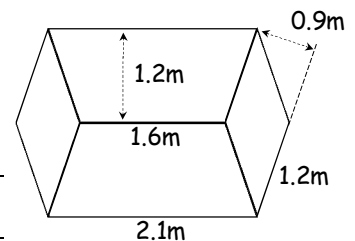


- (9) What is the area of a parallelogram with a base of 4.5cm and a height 9.7cm?
- (10) What is the area of a trapezium which has parallel sides of 20m & 14m and the distance (h) between the parallel sides of 7.2m?
- (11) If the area of a parallelogram is 108cm^2 and the height is 12cm, what length is the base?
- (12) The area of a trapezium is 240m^2 . If the parallel sides are 14m & 18m, what is the distance (h) between the parallel sides?

This diagram shows the shape of a new courtyard.



- (13) Work out the area of this courtyard.
 Note: Not ALL measurements are needed, so use only the side lengths you need.
- (14) If it costs \$11.50 per m^2 to cobble the courtyard, what will be the cost of the cobbles?
- (15) What shapes make up this compound shape?
- (16) Work out the combined area of this compound shape.



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

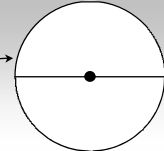
Suggested extension activity:

Find objects around the house that are shaped like parallelograms and trapeziums 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:

The distance around the outside of a circle is called the **circumference**.



Circumference = $\pi d = 2\pi r$

where $\pi = \text{pi} = 3.14$ (2 d.p.), $d = \text{diameter}$ and $r = \text{radius}$.

Example: The diameter of Joe's bike wheel is 0.9m. How far will he travel with each revolution of the wheel?



Answer: $C = 3.14 \times 0.9 = 2.826\text{m}$ (3 d.p.)

Work out the circumference of each circle.

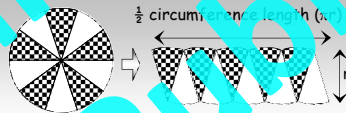
Use $\pi = 3.14$ and round your answers to 2 d.p.

(1) (3)

(2) (4)

(5) The **circumference** of a circle is 274.75cm. Using $\pi = 3.14$, work out the radius of this circle.

A circle can be cut into sectors and rearranged to form a parallelogram.



Area = πr^2 where $\pi = \text{pi} = 3.14$ (2 d.p.), $r = \text{radius}$.

Example: The radius of a circular patterned area is 5m. What is the area of this pattern?



Answer: $A = 3.14 \times 5^2 = 78.5\text{m}^2$ (1 d.p.)

Work out the area of each circle.

Use $\pi = 3.14$ and round your answers to 2 d.p.

(6) (8)

(7) (9)

(10) The **area** of a circle is 279.78cm². Using $\pi = 3.1$, work out the radius of this circle.

Work out the perimeter (circumference) and area of these compound shapes.

Use $\pi = 3.1$ and round your answers to 2 d.p.



(11) working space

P = _____ A = _____

(12) working space

P = _____ A = _____

Work out the area of the shaded regions.

Use $\pi = 3.14$ and round your answers to 2 d.p.

(13) working space

(14) working space

(15) working space



The aim of this activity sheet is to work out the circumference (perimeter) and area of a circle using a given formulae and work with compound shapes.

Suggested extension activity:

Locate various circular shaped objects. Ask your child to measure their diameters, then use this measurement to work out the circumference and areas of the objects.

Example: A C.D. has a diameter of 11.8cm. What is the area?

Make up similar problems as on this worksheet that involve area or perimeter calculations of compound shapes made up of circles, squares, rectangles, parallelograms and trapeziums.

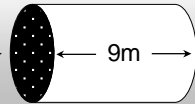
Sign when completed: _____

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

Area of cross-section = 15m^2



Volume $15 \times 9 = 135\text{m}^3$

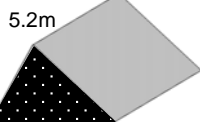
Work out the volume of these objects, given the area of the cross section and the depth.

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

X-sectional area = 15cm^2



X-sectional area = 24m^2

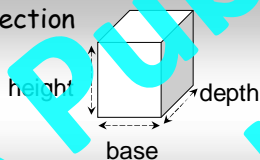


X-sectional area = 14m^2



Many 3D objects have a cross-section based on simple 2D shapes.

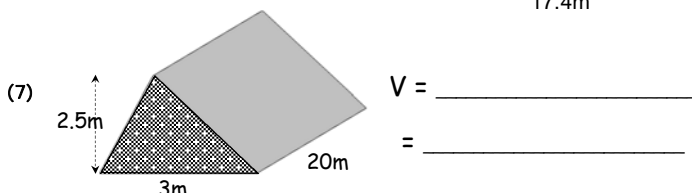
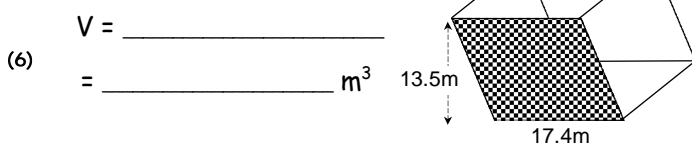
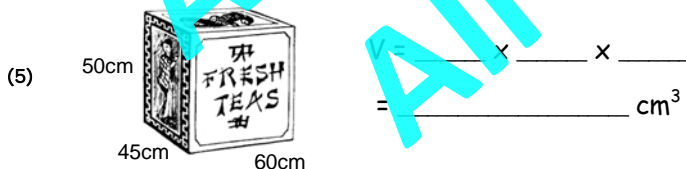
This information can be used to work out the volume.



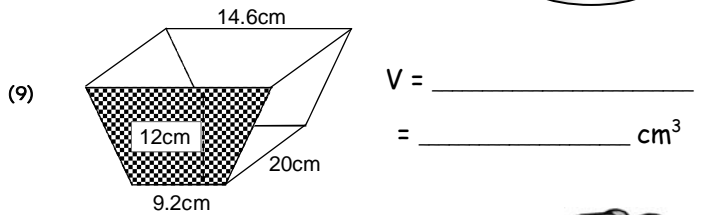
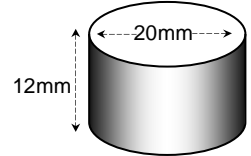
Example: Volume = base × height × depth

Work out the volume of these simple 3D shapes.

Use $\pi = 3.14$ and round your answers to 2 d.p.



(8) $V =$ _____
 $=$ _____ mm^3

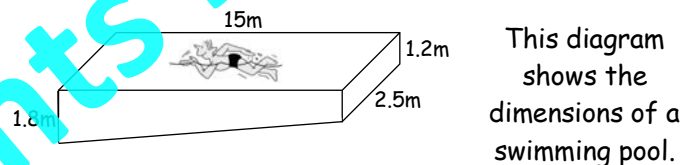


(10) A new concrete path is 75m long, 1.5m wide and 0.25m deep. **Work out** the volume of concrete in this path.

(11) The volume of a rectangular prism is 480cm^3 , with a base of 8cm and a depth of 12cm. **Work out** the height of the prism?

(12) The volume of a rectangular prism is 265.3cm^3 , with a base of 6.4cm and a height of 7.3cm. **Work out** the depth of the prism? (Round to 1 d.p.)

(13) The volume of a triangular shaped prism is 2125cm^3 , with a height of 10cm and a depth of 50cm. **Work out** the base of this prism.



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

(15) The pump 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 objects around your home. Ask your child to measure the appropriate measurements so that the volume of each object can be worked out. Work out the volumes.

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

Sign when completed: _____

Angles can be defined by their size. Use the geometry words to fill in the missing words in this table.

Angle size	Angle name
greater than 0° but less than 90°	(1)
90° or a ¼ turn	(2)
greater than 90° but less than 180°	(3)
180° or a ½ turn	(4)
greater than 180° but less than 360°	(5)



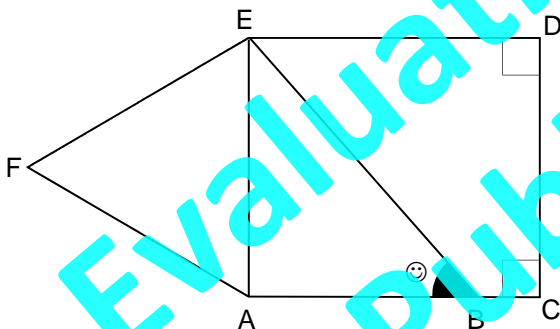
- obtuse
- reflex
- right
- acute
- straight

A diagram of an angle is made up of two lines (DC & DE) and a point where the lines meet (D).



This angle can be named using the three letters. Example: ∠CDE or ∠EDC, where the ∠ symbol means angle.

Look at this diagram.

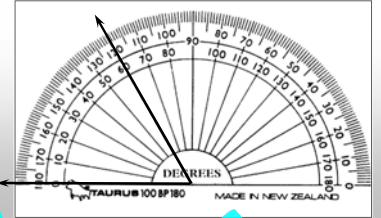


- (6) Name the angle marked with a ☺. _____
- (7) On the diagram, mark ∠FEA with an X.
- (8) On the diagram, mark ∠BAE with an Z.
- (9) Name at least one
 acute angle _____
 right angle _____
 obtuse angle _____
- (10) On the diagram, mark a reflex angle with the letter Y.
- (11) Starting with letter F on the diagram above, write the letters in order going around the outside in an anti-clockwise direction.

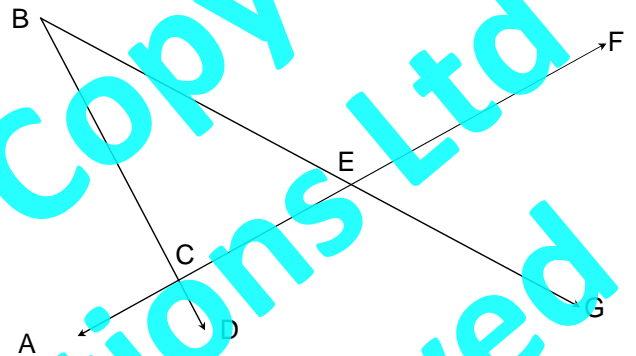


The instrument for measuring and drawing angles is called a **protractor**. There are two scales on a protractor that you can use.

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



Answer: Inside scale and 60° (60 degrees)

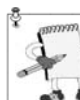


Use a protractor to measure these angles.

- (12) ∠ACB = _____ (14) ∠BEF = _____
 (13) ∠FEG = _____ (15) ∠AEG = _____

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

- (16) ∠ABC = 40°
- (17) ∠SRT = 115°
- A _____ B
 S _____ R



The aim of this activity sheet is to define angles by their size, name angles using letters and draw angles using the appropriate equipment - a protractor and a ruler.

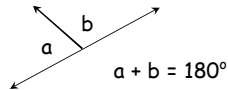
Suggested extension activity:

Draw various shapes involving over-lapping straight lines to create diagrams as on this worksheet. Label the corners with letters, then ask your child to group angles by their size and measure named angles.

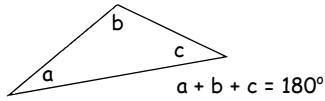
Example: On this diagram, these angles are all acute. There are three obtuse angles. ∠EBC is 78° and ∠ABC is 102°

Sign when completed: _____

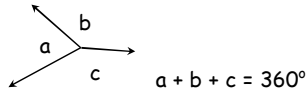
Adjacent angles on a straight line add up to 180°



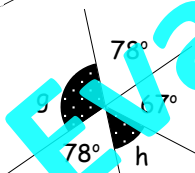
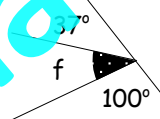
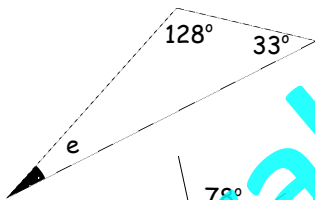
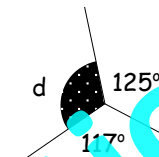
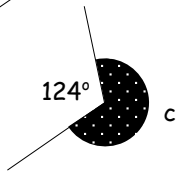
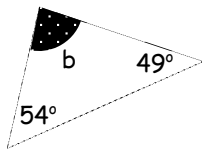
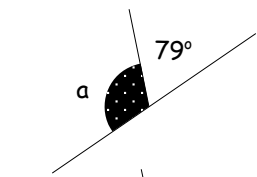
Angles in a triangle add up to 180°



Angles around a point add to 360°



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



∠a = _____

∠b = _____

∠c = _____

∠d = _____

∠e = _____

∠f = _____

∠g = _____

∠h = _____

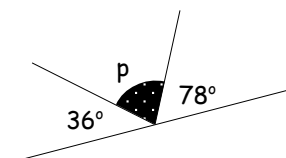
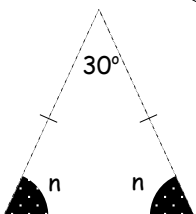
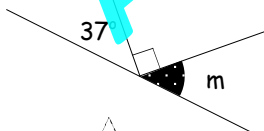
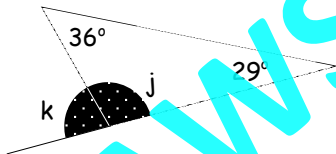
∠j = _____

∠k = _____

∠m = _____

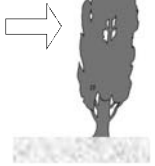
∠n = _____

∠p = _____



- (2) A line of shelter belt trees are growing on a 4.5° lean due to a constant wind from the north.

Work out the acute angle the trees make with the ground.



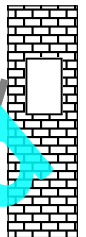
- (3) This tree is growing on a bank that has a slope of 20°.

Work out the acute angle the tree makes with the ground (☺).



- (4) A ladder is leaning up against a building. The angle at the top is 16.5°

Work out the angle the ladder makes with the ground.



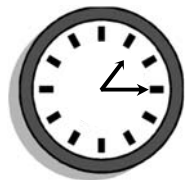
- (5) A second ladder makes an angle with the ground that is five times larger than the angle at the top. **Work out the angle where the ladder touches the house.**

- (6) The chimney on this roof makes an obtuse angle of 107°.

Work out the slope of the roof.



- (7) **Work out the reflex angle these hands make on each clock face. Do not measure.**





The aim of this activity sheet is to use angle rules to find the size of missing angles.

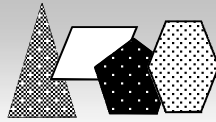
Suggested extension activity:

Draw similar diagrams as on this worksheet. Ask your child to work out the missing angles using the various angle rules. Remember the diagrams do not need to be drawn to scale.

Sign when completed: _____

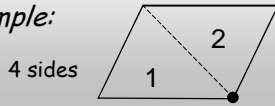
A **polygon** is a closed 2D shape that has three or more straight sides.

Example: A triangle has 3 sides, a quadrilateral has 4 sides ...



To work out the **sum of the interior angles** of a polygon, use only **ONE** corner, from which to divide the polygon into triangles.

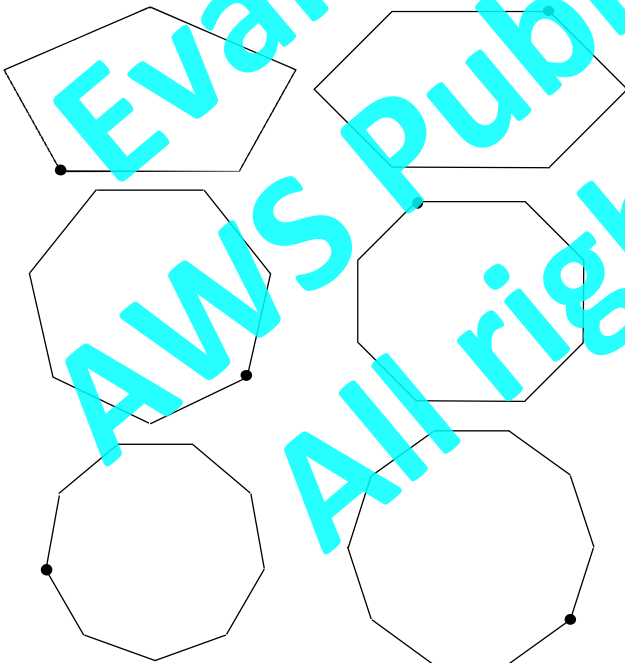
Example:



A 4 sided polygon can be divided into 2 triangles.
 $\Rightarrow 2 \times 180^\circ = 360^\circ$

Using the method above and the diagrams below, **work out the interior angle sum** for the polygons listed in the table. Start from the marked corner.

Number of sides	Name	No. of triangles	Interior angle sum calculation
4	quadrilateral	2	$2 \times 180^\circ = 360^\circ$
5	(1)		
6	(2)		
7	(3)		
8	(4)		
9	(5)		
10	(6)		

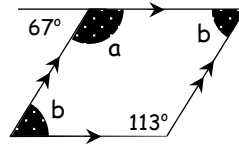


(7) **Create** a word or algebraic rule for working out the '**sum of the interior angles**' (S) of a polygon, where $n = \text{number of sides}$.

(8) Use your rule to **work out** the interior angle sum for a 15 sided and 20 sided polygon.

(9) **Work out** the size of the missing angles.

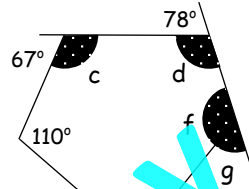
(Note: Diagrams are not drawn to scale, so do not measure.)



$\angle a =$ _____

$\angle b =$ _____

$\angle c =$ _____

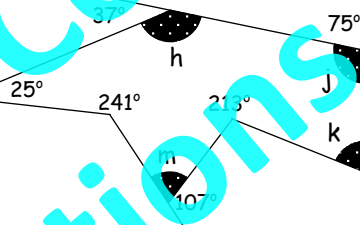


$\angle d =$ _____

$\angle e =$ _____

$\angle f =$ _____

$\angle g =$ _____



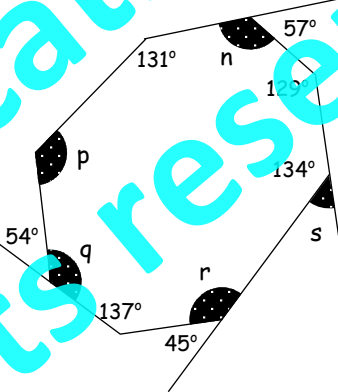
$\angle h =$ _____

$\angle j =$ _____

$\angle k =$ _____

$\angle m =$ _____

$\angle n =$ _____



$\angle p =$ _____

$\angle q =$ _____

$\angle r =$ _____

$\angle s =$ _____

$\angle t =$ _____

$\angle u =$ _____

$\angle v =$ _____

$\angle w =$ _____

$\angle x =$ _____



The aim of this activity sheet is to work out the sum of the interior angles for different polygons and use this information to find missing angles.

Suggested extension activity:

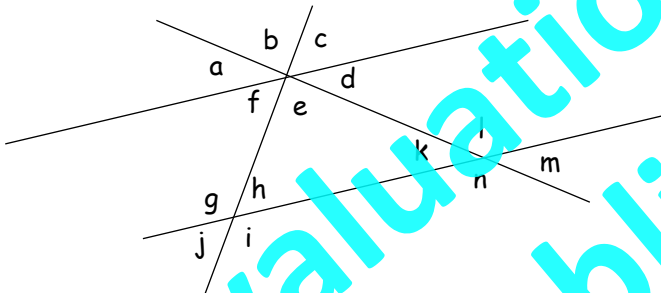
Draw similar diagrams as on this worksheet. Ask your child to work out the missing angles using the various angle rules. Remember the diagrams do not need to be drawn to scale.

Sign when completed: _____

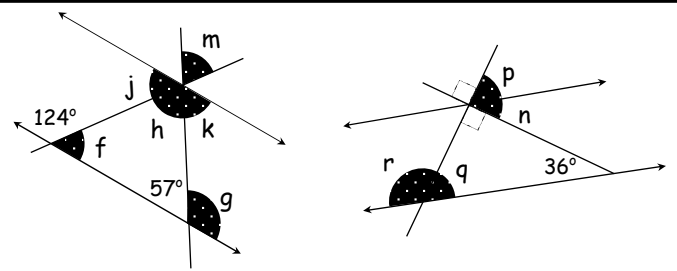
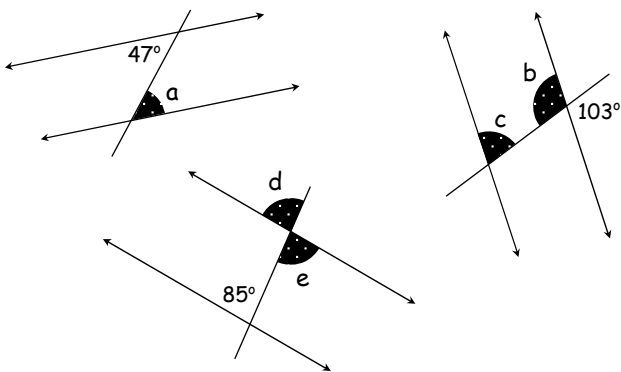
These arrows are pointing in the same direction.
 "Are the arrows **parallel** or **perpendicular** to each other?" asked Joe.
 Answer: parallel (perpendicular lines cross at right angles).

Corresponding angles are EQUAL		$a = b$
Alternate angles are EQUAL		$a = b$
Co-interior angles add up to 180°		$a + b = 180°$
Vertically opposite angles are EQUAL		$a = c$ $b = d$

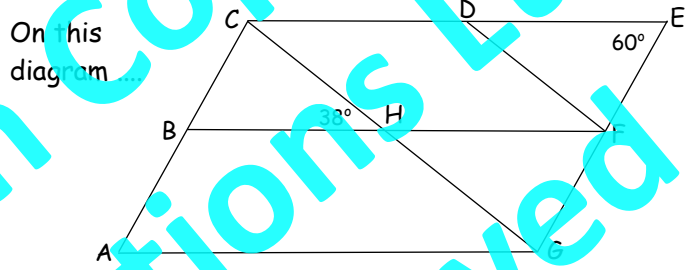
Use the angle rules above to answer questions 1 to 4



- List 4 pairs of corresponding angles.
- List 4 pairs of alternate angles.
- List 2 pairs of co-interior angles.
- List 4 pairs of vertically opposite angles.
- Work out the size of the missing angles.
 (Note: Diagrams are not drawn to scale, so do not measure.)



- | | | |
|--------------------|--------------------|--------------------|
| $\angle a =$ _____ | $\angle f =$ _____ | $\angle m =$ _____ |
| $\angle b =$ _____ | $\angle g =$ _____ | $\angle n =$ _____ |
| $\angle c =$ _____ | $\angle h =$ _____ | $\angle p =$ _____ |
| $\angle d =$ _____ | $\angle j =$ _____ | $\angle q =$ _____ |
| $\angle e =$ _____ | $\angle k =$ _____ | |



Lines AG, BF & CE are parallel, lines AC & GE are parallel and lines CG & DF are parallel. $\angle BHC = 38°$ and $\angle DEF = 60°$

- Explain why $\angle BFG = 60°$.
- Explain why $\angle GCE = 38°$.
- Explain why $\angle GHF = 38°$.
- Explain why $\angle BFE = 120°$.
- Work out the size of $\angle CGF$. Give a reason.
- Work out the size of $\angle CAG$. Give a reason.
- Work out the size of $\angle CDF$. Give a reason.

The aim of this activity sheet is to use angle rules for parallel lines to find the size of missing angles.

Suggested extension activity:
 Draw similar diagrams as on this worksheet. Ask your child to work out the missing angles using the various angle rules. Remember the diagrams do not need to be drawn to scale.

Sign when completed: _____

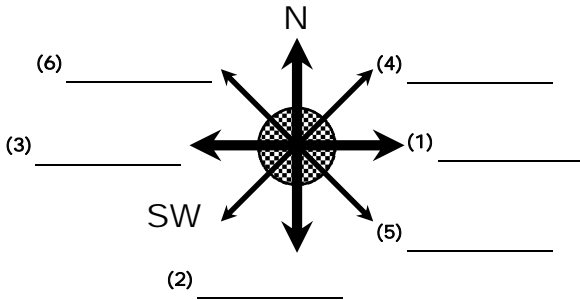
When you do not have a road to follow, using a compass can help you find your way around.



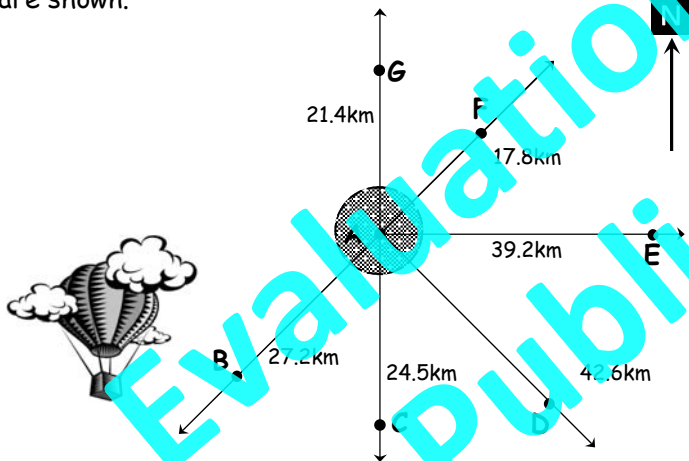
Example: Jack flew his plane 4km south, then headed southwest for 6km.

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 south of Town A? _____
- (8) Which town is 42.6km 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 NW of Town A. Using the scale below, draw on the map the position of Town H.

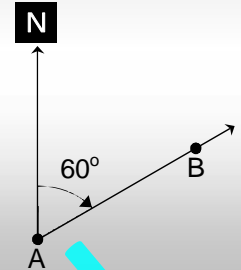


A direction can be given as a bearing. Measured in a clockwise direction from North, the bearing is the angle between north and the direction.

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°.

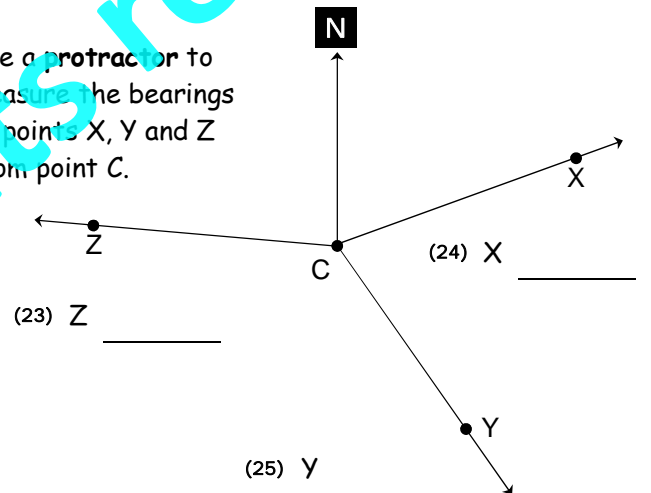
That means point B is at a bearing of 60° from point A.



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

- (16) L _____
- (17) M _____
- (18) N _____
- (19) O _____
- (20) P _____
- (21) Q _____
- (22) Point R is at a bearing of 330°. Mark point R on the compass above.

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



- (23) Z _____
- (24) X _____
- (25) Y _____



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

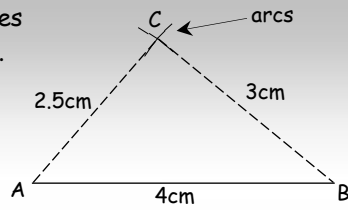
Suggested extension activity:

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: _____

Draw a triangle ABC with sides lengths of 4cm, 3cm & 2.5cm.



Answer:

Draw a 4cm line with a ruler (label AB).

Draw an arc, centre A with radius 2.5cm.

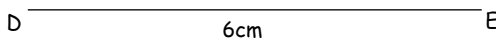
Draw an arc, centre B with radius 3cm.

Where the arcs cross, label this point C.

Join AC and BC with straight lines to complete the triangle.

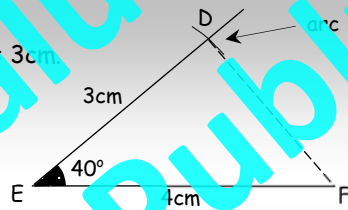


- (1) Use a ruler and a compass to construct triangle DEF, where DE = 6cm, DF = 4cm and EF = 3cm.



- (2) Use a ruler and a compass to construct triangle GHI, where all sides are 30mm long.

Draw a triangle DEF, where $\angle DEF = 40^\circ$, EF = 4cm & FD = 3cm.



Answer:

Draw a 4cm line with a ruler (label EF).

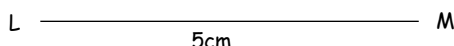
Draw $\angle DEF = 40^\circ$ on line EF.

Draw an arc, centre E with radius 3cm, label this point D.

Join DF with a straight line to complete the triangle DEF.



- (3) Use a ruler, protractor and a compass to construct triangle LMN, where $\angle LMN = 35^\circ$, ML = 5cm and MN = 2.5cm.

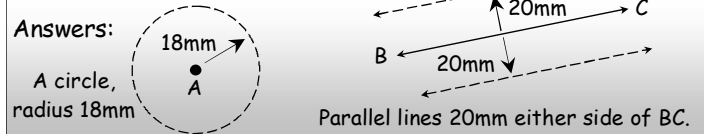


- (4) Use a ruler, protractor and a compass to construct triangle RST, where ...
 $\angle STR = 45^\circ$,
 TS = 45mm &
 TR = 30mm.

A locus is a set of points that satisfies a given requirement. Loci is the plural of locus.

Example: Draw all points that are 18mm from point A.

Draw all points 20mm from line BC.

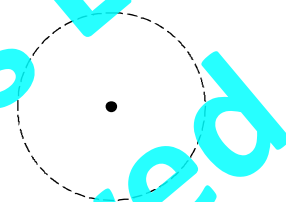


- (5) Draw the locus that is 1.5cm from point E.

- (6) Draw the locus that is 12mm from point F.



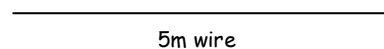
- (7) Draw the loci that are 5mm from this circle.



A pet lamb is tied to a 2 metre rope, that is attached to a 5 metre wire. The rope can slide down the wire and the lamb can move either side of the wire.



- (8) Using a scale of 1cm = 1m, complete the diagram to show the locus of the maximum distance the lamb can walk.



- (9) Work out the distance the lamb walks doing one complete revolution of this maximum distance.
 ($C = 2\pi r$, where $\pi = \text{pi}$ and use $\pi = 3.14$)



The aim of this activity sheet is to draw accurate diagrams of shapes or loci using mathematical instruments.

Suggested extension activity:

Ask your child to draw accurate scale diagrams of various shapes or pathways, given specific measurements.

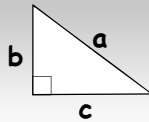
Example: Draw a rectangle with sides of 30mm and 55mm.

Draw a parallelogram with sides of 4cm and 6cm, with co-interior angles of 60° & 120° .

Sign when completed:

The longest side of a right-angled triangle is opposite the right-angle. It is called the **hypotenuse**.

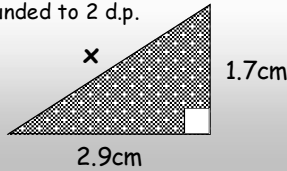
The **Pythagoras** relation states ...
'the square of the hypotenuse equals the sum of the squares of the other two sides':



$a^2 = b^2 + c^2$, where a = length of the hypotenuse.

Example: Find the length of side x, rounded to 2 d.p.

Answer: $x^2 = 2.9^2 + 1.7^2$
 $x^2 = 8.41 + 2.89$
 $x = \sqrt{11.3}$
 $x = 3.36$ (2 d.p.)



The three trigonometry ratios are ...

Sine of $\angle A$ = $\frac{\text{length of opposite side}}{\text{length of hypotenuse}}$ ($S = O/H$)

Cosine of $\angle A$ = $\frac{\text{length of adjacent side}}{\text{length of hypotenuse}}$ ($C = A/H$)

Tangent of $\angle A$ = $\frac{\text{length of opposite side}}{\text{length of adjacent side}}$ ($T = O/A$)

The letter SOHCAHTOA is a good way to remember the trig ratios.

For each triangle write **Sin A**, **Cos A** and **Tan A** as fractions and then convert each fraction to a decimal (round to 4 d.p.).



(8) $\sin A = \frac{3.2}{3.7} = \underline{\hspace{2cm}}$
 $\cos A = \frac{1.8}{3.7} = \underline{\hspace{2cm}}$
 $\tan A = \frac{3.2}{1.8} = \underline{\hspace{2cm}}$

(9) $\sin A = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$
 $\cos A = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$
 $\tan A = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Write trig ratios for the following angles, first as fractions and then convert each fraction to a decimal (round to 4 d.p.).



(10) $\tan A = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(11) $\cos C = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(12) $\sin A = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

(13) $\cos A = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Work out the length of side h on these triangles.

Round your answers to 2 d.p.

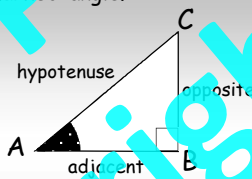
(1) $h^2 = 1.2^2 + 3^2$
 $h^2 = \underline{\hspace{2cm}}$
 $h = \underline{\hspace{2cm}}$

(2) $h = \underline{\hspace{2cm}}$
 $\underline{\hspace{2cm}}$
 $\underline{\hspace{2cm}}$

(3) $h = \underline{\hspace{2cm}}$
 $\underline{\hspace{2cm}}$
 $\underline{\hspace{2cm}}$

For this right-angled triangle, $\angle A$ is the marked angle. The sides can be named as follows....

- AC = Hypotenuse**
(The side opposite the right angle)
- AB = Adjacent side**
(The side next to the marked angle)
- BC = Opposite side**
(The side opposite to the marked angle)



Example: If angle C was the marked angle above, name the adjacent and opposite sides.
 Answers: CB = adjacent side, AB = opposite side.

On each triangle, one angle is marked. Label the hypotenuse (H), opposite (O) and adjacent (A) sides relative to the marked angle on each triangle.

(4)

(5)

(6)

(7)



The aim of this activity sheet is to use the Pythagoras relation to work out the length of missing sides on right angled triangles and introduce trigonometry ratios.

Suggested extension activity:

Draw similar diagrams as on this worksheet. Ask your child to work out the missing side using the Pythagoras relation. Try finding the length of one of the shorter sides by rearranging the rule to $b^2 = a^2 - c^2$. Ask your child to practise writing trig ratios of where the length of two sides of a right angled triangle are known. On the worksheet 32, the trig ratios will be used to find the size of missing angles or sides.

Sign when completed: _____

Using either a scientific calculator or trig tables, a trig ratio can be converted to an angle.

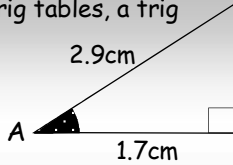
Example: $\cos A = \frac{1.7}{2.9} = 0.5862$

(adjacent side = 1.7cm, hypotenuse = 2.9cm)

On a calculator, enter $1.7 \div 2.9 = \text{INV Cos}$

(Make sure your calculation is set on 'degrees'. Inv also called 2nd F)

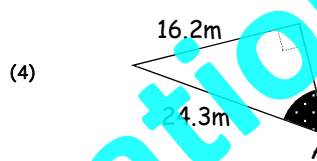
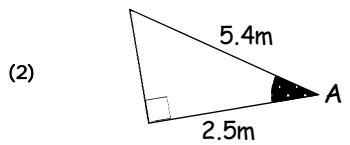
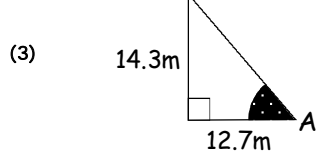
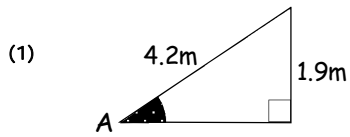
Answer: If $\cos A = 0.5862$, then $\angle A = 54.1$ (1 d.p.)



Given two sides, use a trig ratio to work out the size of $\angle A$ (rounded to 1 d.p.)



You will need a scientific calculator or trig tables.



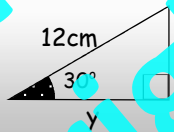
Using either a scientific calculator or trig tables, all angles can be converted to a decimal.

Example: $\sin 30^\circ = 0.5$, $\cos 30^\circ = 0.8660$, $\tan 30^\circ = 0.5774$

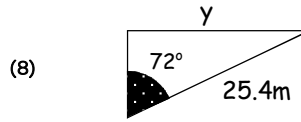
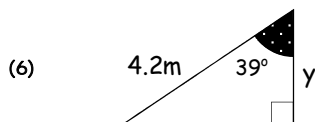
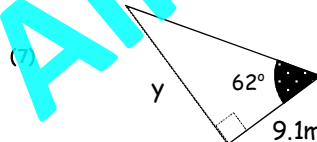
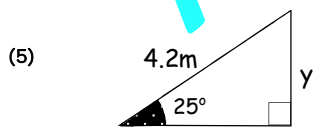
On a calculator, enter 30 Sin or $\text{Sin } 30$ depending on your model.

Find the length of side y (adjacent), given an angle and a side (hypotenuse).

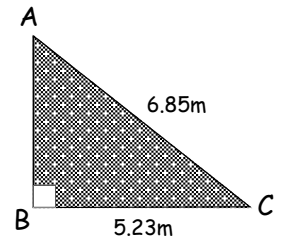
Answer: $\cos 30^\circ = \frac{y}{12}$
 $y = 12 \times \cos 30^\circ$
 $y = 10.392$ (2 d.p.)



Given an angle and one side, use a trig ratio to work out the length of side y . Rounded to 2 d.p.



Use trig ratios to work out the size of $\angle BAC$ & $\angle ACB$ and the length of side AB .

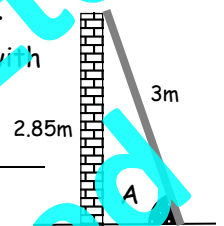


(9) $\angle BAC$ (round 1 d.p.)

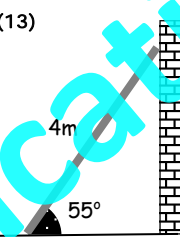
(10) $\angle ACB$ (round 1 d.p.)

(11) side AB (round 2 d.p.)

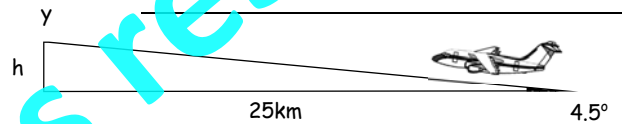
(12) A 3m ladder is leaning against a 2.85m high brick wall. Work out the angle (A) the ladder makes with the ground. (round to 1 d.p.)



(13) A 4m ladder leaning against a wall makes an angle of 55° with the ground. Work out how far (y) the ladder is from the base of the wall. (round 2 d.p.)



(14) A plane is climbing at a constant angle of 4.5° . Work out how much higher it will be once it has travelled a further 25km. (round 2 d.p.)



(15) A ball is rolling down a 90m sloping drive, as shown in this diagram. Work out the slope of the drive. (round 1 d.p.)



The aim of this activity sheet is to use the trigonometry ratios to work out the length of missing sides and the size of missing angles.

Suggested extension activity:

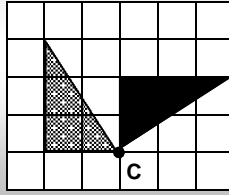
Draw similar diagrams as in Q1 to Q4, where TWO sides are given. Ask your child to label the given sides as adjacent, opposite or hypotenuse and use the correct trig ratio to work out one of the angles. Draw similar diagrams as in Q5 to Q8, where ONE side and ONE angle are given. Ask your child to work out the length of a missing side, using the correct trig ratio.

Sign when completed:

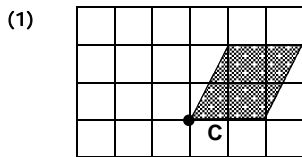
To rotate a shape or an object, you need an **angle of rotation** and a **centre of rotation**.

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

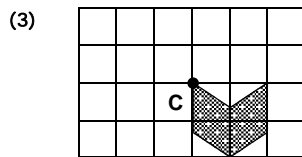
The new position of the triangle is the black shape, called the image.



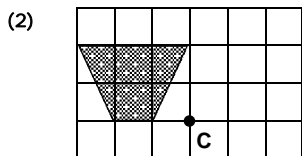
Draw the new position of each shape after it has been rotated as directed.



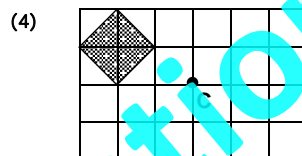
Rotate this shape a quarter turn (90°) anti-clockwise about point C.



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



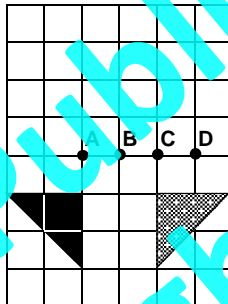
Rotate this shape a quarter turn (90°) clockwise about point C.



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

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

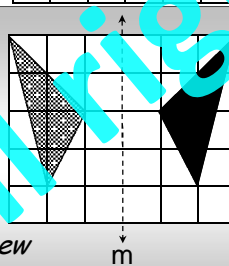
Describe this rotation and name the centre of rotation.



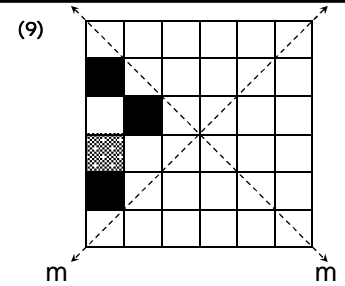
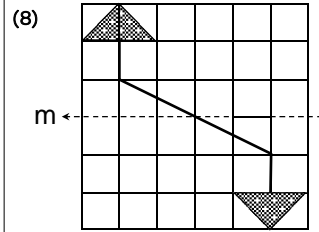
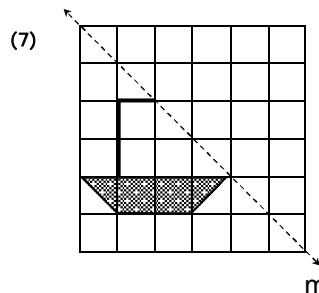
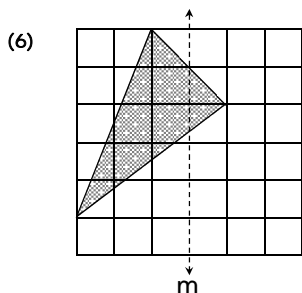
For a shape to be reflected, there must be a **line of symmetry (m)**.

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

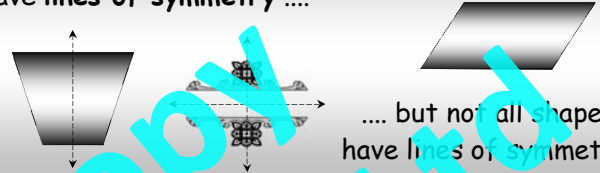
Example: The shaded triangle (object) has been reflected to its new position, the black triangle, called its image.



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

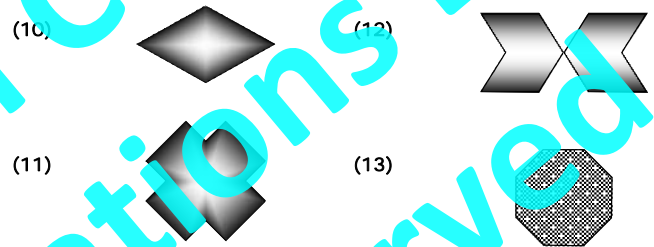


Below are examples of shapes and diagrams that have **lines of symmetry** ...

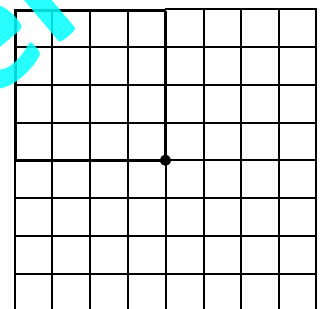


... but not all shapes have lines of symmetry.

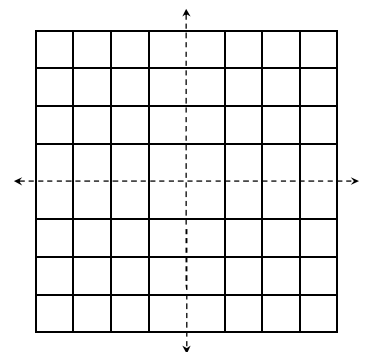
Draw in the line(s) of symmetry for these shapes.



(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.



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.

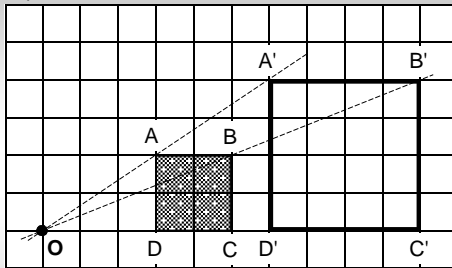
Example: Wallpaper or floor tile patterns.

Ask your child to create their own designs using rotation or reflection and have them describe how they created their design.

Sign when completed:

To enlarge a shape (object), a **scale factor** and a **centre of enlargement** are required.

Example:
Shape ABCD (object) has been enlarged by a scale factor of 2 & centre O to create A'B'C'D' (image).



With a scale factor of 2, all corners of ABCD are now twice as far from the centre i.e. image A'B'C'D'.

Example: Corner A is 2 up & 3 right from the centre. whereas corner A' is 4 up & 6 right.



Enlarge each shape (object) by the given scale factor and centre O. Label the image corners.

(1) scale factor = 2

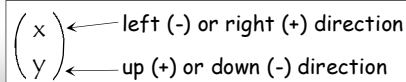
(2) scale factor = 2

(3) scale factor = $\frac{1}{2}$ (Makes the shape smaller)

Join the corners of the object with corresponding corners on the image to locate the centre of the enlargement and work out the scale factor.

(4) scale factor = _____

A **vector** drawn on a grid has **direction & distance** and can be described using numbers in the form ...



Describe each vector using two numbers as above.

Example: $\vec{a} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ has been drawn on the grid above.

(5) $\vec{b} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(6) $\vec{c} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(7) $\vec{d} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(8) $\vec{e} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(9) Draw $\vec{m} = \begin{pmatrix} 0 \\ 4 \end{pmatrix}$ & $\vec{n} = \begin{pmatrix} 3 \\ -3 \end{pmatrix}$ on the grid above.

A vector is a way of describing how a point or shape has been moved without being rotated, reflected or enlarged. This type of movement is called a **translation**.

Describe how each shape (object) has been moved (image) using a translation vector. Example: $A \Rightarrow A'$

(10) $\vec{A} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(11) $\vec{B} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(12) $\vec{C} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(13) $\vec{D} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(14) **Move this shape by vector E, then by vector F.**

$\vec{E} = \begin{pmatrix} 10 \\ 2 \end{pmatrix}$

$\vec{F} = \begin{pmatrix} -7 \\ -3 \end{pmatrix}$

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 enlargement or translation.
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: _____

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 dividing 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** for each group of scores and round your answers to **1 decimal place** (1 d.p.)



- (1) 8, 5, 3, 9, 8, 6, 7, 9, 12, 7 _____
- (2) 35, 56, 69, 42, 51, 32, 78 _____
- (3) 123, 189, 152, 147, 201, 187 _____
- (4) 1.5, 2.2, 3.8, 1.9, 4.1, 6.3, 1.9, 5.7 _____

The **median** is worked out by ...

Writing 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 group of scores.

- (5) 6, 7, 9, 12, 7, 8, 5, 3, 9 _____
- (6) 35, 56, 32, 78, 69, 42, 51 _____
- (7) 3.23, 3.89, 3.52, 3.47, 3.01, 3.62 _____
- (8) 1.9, 4.1, 6.3, 1.9, 5.7, 1.5, 2.2, 3.8 _____

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 group of scores.

- (9) 10, 12, 10, 11, 6, 14, 15, 6, 13, 10 _____
- (10) 16, 15, 12, 14, 16, 15, 14, 11 _____
- (11) 15.03, 15.09, 15.03, 15.00, 15.09 _____
- (12) 136, 175, 127, 168, 166, 171 _____

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 = 8 (11 - 3)**



Work out the **range** of each group of scores.

- (13) 37, 40, 94, 63, 95, 112, 54 _____
- (14) 106, 73, 66, 154, 93, 42, 174, 21 _____
- (15) 140, 63, 262, 97, 59, 115, 423 _____
- (16) 9.4, 4.3, 11.9, 15.4, 7.1, 3.3, 2.9 _____

Jody goes for bike rides in the weekend. The distances recorded below are in kilometres.



34.3, 38.7, 27.9, 52.1, 36.4, 43.7, 52.1, 34.8

- (17) For how many weekends has Jody been riding? _____
- (18) Work out the 'average' distances and range for Jody's bike rides.

Mean = _____

Median = _____

Mode = _____

Range = _____

Sam plays a computer car racing game. The fastest lap times for each game are recorded below in seconds.



57.2, 54.2, 58.1, 59.3, 60.4, 55.7, 56.3, 57.4, 60.9

- (19) Work out the 'average' lap times and range for Sam's computer racing game?

Mean = _____

Median = _____

Mode = _____

Range = _____



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). Ask your child to work out the three 'averages' and range of the scores.

Example: The hours spent playing computer games etc. The weight of 20 apples. The height of people in your family.

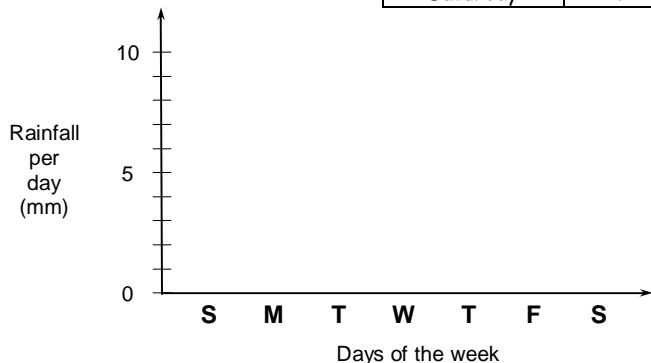
Think about which average is the best to use and why.

Sign when completed: _____

This table shows the daily rainfall details for a week, recorded in millimetres.

	Rainfall
Sunday	6
Monday	9
Tuesday	8
Wednesday	0
Thursday	6
Friday	7
Saturday	4

(1) Complete this column graph using the data in the table.



- (2) How many millimetres of rain fell on Wednesday? _____
- (3) On which day did 7mm of rain fall? _____
- (4) For this time of the year, the daily average rainfall is 8mm. How does this week compare? _____

Pupils in Room 7 have 24 pet cats and dogs.

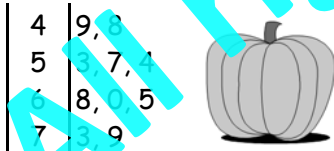


Key: 1 picture = 2 pets

This pictogram shows the number of pet cats Room 7 pupils have.

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

This stem & leaf graph shows the weight in kilograms of pumpkins in a competition.



- (8) List the pumpkin weights in order from lightest to heaviest.
_____, _____, _____, _____, _____,
_____, _____, _____, _____, _____

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

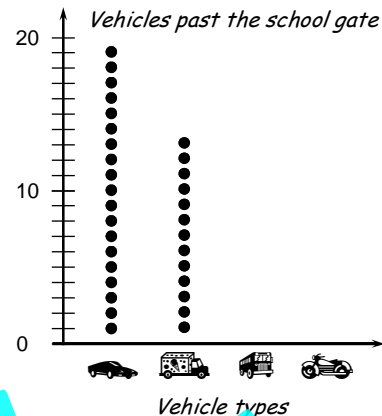


- 415, 423,
- 429, 400,
- 433, 412,
- 417, 436,
- 402, 429,
- 416, 438



The number of cars, trucks, buses and bikes going past the school in 15 minutes was 45.

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



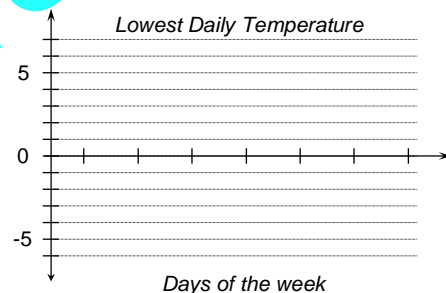
- (10) How many cars and trucks went past the school gate? _____
- (11) Draw 9 dots on the graph to represent the buses that went past the gate.
- (12) How many bikes went past the gate? _____
- (13) Complete the dot plot above to show how many bikes went past the school gate.

This table shows the lowest daily temperatures (°C) recorded for a week, starting on Sunday.

4°C	-1°C	2°C	-4°C	0°C	3°C	-2°C
-----	------	-----	------	-----	-----	------

- (14) Plot the data on a time series graph, joining each point with a straight line.

Temperature (°C)



- (15) What were the temperatures on Wednesday and Saturday? _____
- (16) What is the range of temperatures for this week? _____



The aim of this activity sheet is to revise different data displays - column graphs, pictograms, stem & leaf graphs, dot plots and time series graphs.

Suggested extension activity:

Collect or make up appropriate groups of data that can be displayed by using the graphs on this worksheet. Ask your child to decide, then create the graphs which best display each group of data scores.

Example: Weigh 10 kiwi fruit and draw a stem & leaf graph. Draw a time series graph of the highest daily temperatures of Auckland. Record the car colours of 36 cars and draw a dot plot of the results.

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.

How many pupils scored between 10 and 14?

How many scored exactly 22?

Answers: 6 pupils, impossible to work out (3 pupils scored 20 - 24)

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

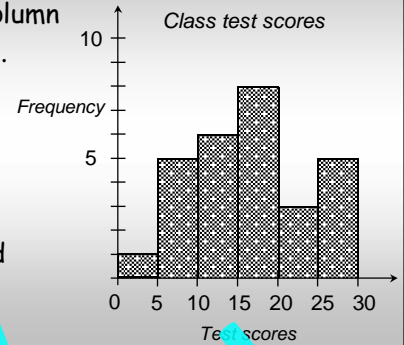
Grouped discrete data and continuous data can be displayed in a **histogram**.

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



In a poster drawing competition, pupils were given a mark out of 100, as recorded in the box below.

- 19, 57, 89, 75, 46, 22, 91,
- 48, 35, 52, 68, 73, 58, 69,
- 46, 79, 92, 50, 78, 83, 90,
- 37, 15, 37, 63, 85, 84, 72,
- 81, 62, 41, 55, 78, 87, 27

Score	Tally	F
0 -		
20 -		
40 -		
60 -		
80 -		

- Organise this data using the frequency table.
- How many pupils scored above 60? _____
- How many pupils scored less than 40? _____

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.

How many pupils are taller than 1.4m?

Answers: 15 pupils (8 + 7)

Height	Tally	Frequency
1.1m -		3
1.2m -		4
1.3m -		7
1.4m -		6
1.5 - 1.6m		5
		25

Oranges are graded by their weight. Below are the weights in grams of some oranges.

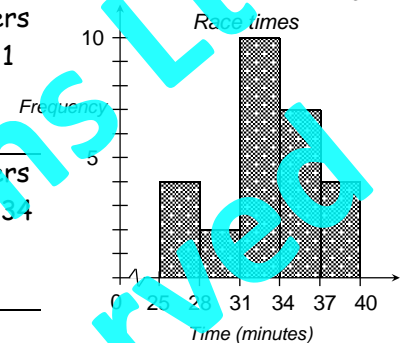
- 80.8, 95.3, 81.6, 82.4, 90.7,
- 94.9, 89.4, 93.7, 95.9, 86.1,
- 94.5, 102.7, 87.8, 90.3, 89.8,
- 95.2, 83.4, 94.9, 96.7, 99.7,
- 91.8, 97.1, 88.4, 83.5, 95.3,
- 88.1, 100.9, 93.2, 91.9, 82.3,
- 86.5, 91.3, 99.3, 92.1, 84.9

Weight (gms)	Tally	F
80.0 --		
85.0 --		
90.0 --		
95.0 --		
100+		

- Organise this data using the frequency table.
- What is the heaviest orange that could be in the 85.0 - group? _____
- Only oranges weighing over 90.0 but under 100.0 grams are for export. How many of these oranges will be exported? _____

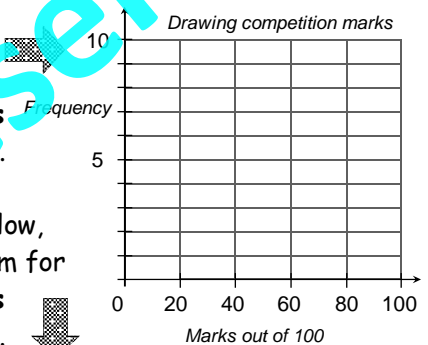
The **histogram** below shows the results of a cross-country race.

- How many runners took less than 31 minutes? _____
- How many runners took more than 34 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.

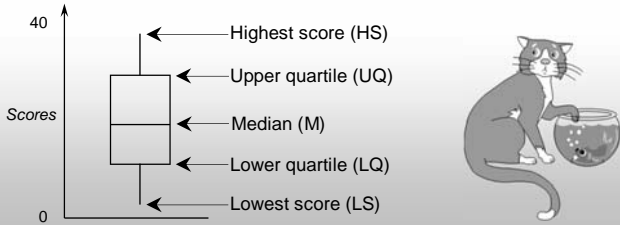
Suggested extension activity:

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 list of scores can be graphed as a **box & whisker graph**, using the **highest** and **lowest** scores and working out the **median**, **lower** and **upper** quartiles.

Example: 12, 14, 16, 17, 20, 21, 23, 24, 28, 32, 36



This **pie graph** has been drawn using a **protractor**.

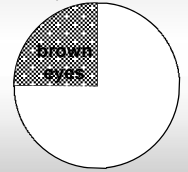
Example: If a quarter of Room 8 pupils have brown eyes, draw the pie graph sector to show this.

Draw a circle with a compass and mark in a radius. There are 360° in a circle.

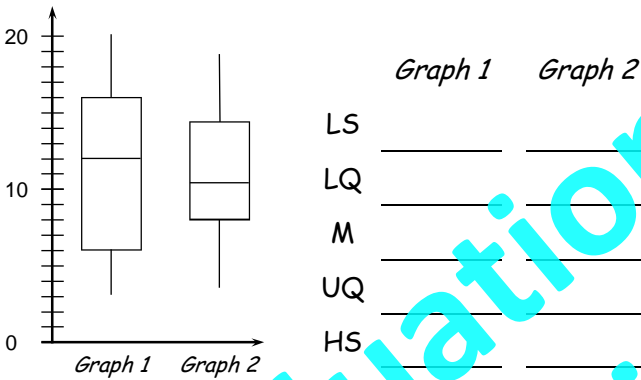
The **sector size** would be ... $\frac{1}{4} \times 360^\circ = 90^\circ$

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.



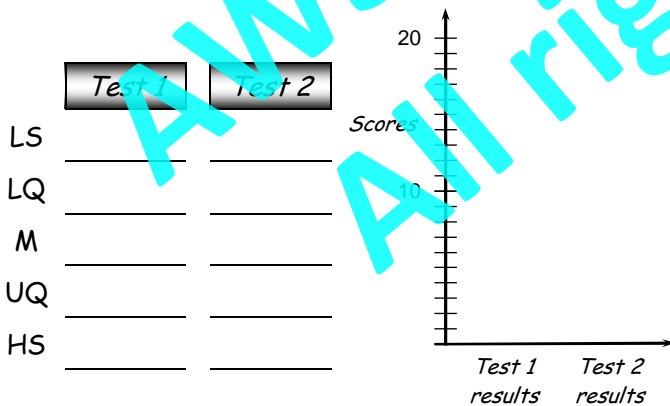
- (1) For each graph, **state** the lowest and highest scores, median, lower and upper quartiles.



Pupils in Room 8 sat two tests. The test was out of 20 and the results are shown below.

Test 1	8, 9, 10, 10, 12, 13, 14, 15, 15, 17, 18
Test 2	10, 10, 12, 13, 14, 14, 14, 15, 16, 19, 20

- (2) For each test, **state** the lowest and highest scores, median, lower and upper quartiles, then **draw** the **box & whisker graphs**.



- (3) **Comment** about the two test results.

- (4) Draw a pie graph with the **sector angles** of 55°, 80°, 105° and 120°.

- (5) In a pie graph a sector angle was 120°. What fraction of the graph does that represent?

- (6) In a pie graph a sector angle was 216°. What percentage of the graph does that represent?

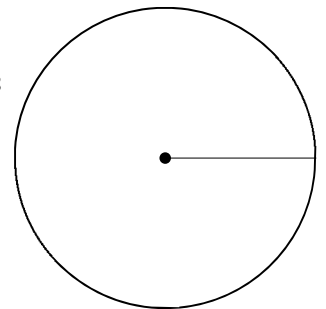
- (7) A local shop sold 160 t-shirts. The table below shows the number of each size sold. **Work out** the sector angles required to draw a pie graph. The first calculation is done for you.

T-shirt size	F	Sector angle size calculation
S	40	$\frac{40}{160} = \frac{1}{4}$, sector angle size = $\frac{1}{4} \times 360^\circ = 90^\circ$
M	70	
L	30	
XL	20	
	160	

- (8) Draw the pie graph using the **sector angles** worked out above and **create** a key below.

Key: T-shirt size

<input type="checkbox"/>	= S	<input type="checkbox"/>	= M
<input type="checkbox"/>	= L	<input type="checkbox"/>	= XL



The aim of this activity sheet is to create a box & whisker graph from a list of scores and accurately create a pie graph.

Suggested HOME activity:

Collect or make up appropriate groups of data that can be displayed by using the graphs on this worksheet.

Example: Measure the length of 20 leaves and use this data to draw a box & whisker graph of the results.

Draw a pie graph to show what activities you got up to in a 24 hour period ... such as 8 hrs sleeping, 1hr playing soccer etc.

Sign when completed:

The **relative frequency** or **experimental probability** of an **event** occurring is the fraction or proportion of times the event occurs.

Example: In an experiment, two coins are tossed 100 times (100 trials). The event recorded was, 'How many times two tails occurs'. This occurred 27 times.

$$\text{Relative frequency} = \frac{\text{Number of times the event occurs}}{\text{Total number of trials}}$$

In the experiment, the number of **trials** was 100, the **event** occurred 27 times, therefore the **relative frequency** or **experimental probability** of the event was $\frac{27}{100}$.

In an experiment, three coins were tossed in the air and what appeared on the coins (in any order) when they landed is recorded in this frequency table.

Event	Tally	F
TTT	### IIII	
TTH	### ### I	
THH	### III	
HHH	### ### II	
Total:		

- How many trials were in this experiment?
- Work out the relative frequency of the event TTT.
- Work out the relative frequency of the event HHH.
- Which event had a relative frequency of $\frac{1}{5}$?
- If the three coins were tossed 120 times, how many times would you expect the event HHH to occur?

Use the frequency table below to record results of your own experiment, 'tossing four coins 50 times'.

Event	Tally	F	Experimental probability
TTTT			
TTTH			
TTTH			
TTHH			
THHH			
HHHH			
Total:			

- Use the **tally column** above to record what appears on the four coins after each toss, then **complete** the frequency (F) column. Note: the order the coins land does not matter.
- Work out the **experimental probability** of each event. Write your answers in the table.
- Based on your results, if the four coins were tossed 500 times, how many times would you expect the event THHH to occur?

For equally likely outcomes, the probability of the event occurring can be worked out using the following ...

$$\text{Theoretical probability} = \frac{\text{Number of ways the event can occur}}{\text{Total number of outcomes}}$$

Example: If a coin is tossed 500 times in the air, how many times would you expect it to land on tails?

There are only two outcomes ... heads or tails.

The **theoretical probability** of the coin landing on tails is 1 chance out of 2 or $\frac{1}{2}$ or 0.5, written as $P(\text{tails}) = \frac{1}{2}$.

Answer: $\frac{1}{2} \times 500 = 250$ times.

All probability values range between 0 and 1. (0 = can never occur, 1 = will always occur).



A bag contains 5 red, 3 white, 4 black and 8 green blocks, all the same size.

- How many blocks in this bag?
- A block is selected from the bag. Work out the theoretical probabilities of these events. Write your answers as a fraction and a decimal.
 - $P(\text{black}) =$ _____
 - $P(\text{green}) =$ _____
 - $P(\text{red or white}) =$ _____
 - $P(\text{white, green or red}) =$ _____
 - $P(\text{pink}) =$ _____
- Which coloured block has a theoretical probability of 0.25 of being selected?
- If a block is selected, then replaced in the bag, 100 times. How many times would you expect it to be a white block?
- If a block is selected, then replaced in the bag, 240 times. How many times would you expect it to be a red block?
- If a white block is selected, but NOT replaced in the bag, work out the theoretical probability of selecting a black block next time?



The aim of this activity sheet is to understand the two ways of working out probability - experimental and theoretical probability.

Suggested HOME activity:

Make up a bag of 10 different colour blocks, all the same size.

Example: 3 red, 5 blue and 2 black blocks.

Ask your child to work out the theoretical probability of selecting each colour. If a block is drawn and replaced from the bag 50 times, predict how many times each colour should be selected. Conduct an experiment and compare the results with the theoretical probabilities.

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** can help.

Example: Two coins are tossed in the air.

	H	T
H	HH	HT
T	TH	TT

Answer: 4
 How many outcomes are there?
 (H,H) = head/head
 (H,T) = head/tail
 (T,H) = tail/head
 (T,T) = tail/tail

One of four cards (H, D, S, C) is selected and a six sided die (1, 2, 3, 4, 5, 6) is thrown at the same time.

	1	2	3	4	5	6
	D1					

- Use this grid to work out all possible outcomes. (Write letters / numbers only)
- How many outcomes are there? _____
- Use this information to work out the following probabilities of these events.

Write your answers as a fraction and a decimal.

- P(H, 4) = _____
 P(S, an even number) = _____
 P(Any card, 6) = _____
 P(C or S, odd number) = _____
 P(C, 7) = _____

- If a card is selected and the die tossed 100x, how many times would you expect the ace of diamonds and any number to occur? _____

A **tree diagram** can also be used, so named because of its shape.

Example: Two coins are tossed in the air.

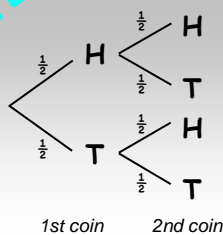
To find all possible outcomes, follow each branch of the tree diagram ...

4 branches so there will be 4 outcomes.
 (H, H), (H, T), (T, H) & (T, T)

The probability of each event can be added to the tree diagram ... that is $P(H) = \frac{1}{2}$ and $P(T) = \frac{1}{2}$.

To **work out** the probability of any event, such as P(T, H) in that order, follow the branches of each event and **multiply** their probabilities.

Example: $P(T) \times P(H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

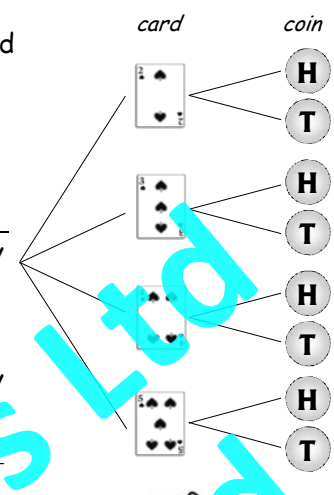


To find the probability of more than one event, such as P(H, T) or P(T, T) occurring, work out the probability of each event, then add the probabilities together.

Example: $P(H, T) = \frac{1}{4}$ and $P(T, T) = \frac{1}{4}$, therefore probability of P(H, T) or P(T, T) occurring is $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$.

This tree diagram shows the possible outcomes when a card is selected and a coin tossed.

- How many outcomes are there? _____
- What is the probability of selecting any card? _____
 What is the probability of the coin landing on heads or tails? _____
- Write the probability of each event on the tree diagram.
- Use the tree diagram to work out the following probabilities of these events. Write your answers as a fraction and a decimal.
 $P(2, T) =$ _____
 $P(4, H \text{ or } T) =$ _____
 $P(\text{Any card}, T) =$ _____
 $P(3 \text{ or } 5, H) =$ _____
 $P(6, T) =$ _____
- If a card is selected and a coin tossed 240x, how many times would you expect the 3 of spades and heads to occur? _____
- In another experiment, a die is also rolled after a card is selected and a coin is tossed (as above).
Work out the probability of
 $P(4 \text{ of spades}, \text{Tails}, 6) =$ _____



The aim of this activity sheet is to investigate the use of grids or tree diagrams to work out all possible outcomes and calculate probabilities of various events.

Suggested extension activity:
 Create similar questions as on this activity, using grids or tree diagrams to work out outcomes and probabilities.
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: _____

Addition and subtraction facts presented in this resource:

Family of Facts
1 + 1 = 2
2 - 1 = 1
1 + 2 = 3
2 + 1 = 3
3 - 2 = 1
3 - 1 = 2
1 + 3 = 4
3 + 1 = 4
4 - 3 = 1
4 - 1 = 3

Family of Facts
2 + 2 = 4
4 - 2 = 2
1 + 4 = 5
4 + 1 = 5
5 - 4 = 1
5 - 1 = 4
2 + 3 = 5
3 + 2 = 5
5 - 3 = 2
5 - 2 = 3

Family of Facts
1 + 5 = 6
5 + 1 = 6
6 - 5 = 1
6 - 1 = 5
2 + 4 = 6
4 + 2 = 6
6 - 4 = 2
6 - 2 = 4
3 + 3 = 6
6 - 3 = 3

Family of Facts
1 + 6 = 7
6 + 1 = 7
7 - 6 = 1
7 - 1 = 6
2 + 5 = 7
5 + 2 = 7
7 - 5 = 2
7 - 2 = 5
3 + 4 = 7
4 + 3 = 7
7 - 4 = 3
7 - 3 = 4

Family of Facts
1 + 7 = 8
7 + 1 = 8
8 - 7 = 1
8 - 1 = 7
2 + 6 = 8
6 + 2 = 8
8 - 6 = 2
8 - 2 = 6
3 + 5 = 8
5 + 3 = 8
8 - 5 = 3
8 - 3 = 5

Family of Facts
4 + 4 = 8
8 - 4 = 4
1 + 8 = 9
8 + 1 = 9
9 - 8 = 1
9 - 1 = 8
2 + 7 = 9
7 + 2 = 9
9 - 7 = 2
9 - 2 = 7

Family of Facts
3 + 6 = 9
6 + 3 = 9
9 - 6 = 3
9 - 3 = 6
4 + 5 = 9
5 + 4 = 9
9 - 5 = 4
9 - 4 = 5
1 + 9 = 10
9 + 1 = 10
10 - 9 = 1
10 - 1 = 9

Family of Facts
2 + 8 = 10
8 + 2 = 10
10 - 8 = 2
10 - 2 = 8
3 + 7 = 10
7 + 3 = 10
10 - 7 = 3
10 - 3 = 7
4 + 6 = 10
6 + 4 = 10
10 - 6 = 4
10 - 4 = 6

Family of Facts
5 + 5 = 10
10 - 5 = 5
9 + 2 = 11
2 + 9 = 11
11 - 2 = 9
11 - 9 = 2
8 + 3 = 11
3 + 8 = 11
11 - 3 = 8
11 - 8 = 3

Family of Facts
7 + 4 = 11
4 + 7 = 11
11 - 4 = 7
11 - 7 = 4
6 + 5 = 11
5 + 6 = 11
11 - 5 = 6
11 - 6 = 5
9 + 3 = 12
3 + 9 = 12
12 - 3 = 9
12 - 9 = 3

Family of Facts
8 + 4 = 12
4 + 8 = 12
12 - 4 = 8
12 - 8 = 4
7 + 5 = 12
5 + 7 = 12
12 - 5 = 7
12 - 7 = 5
6 + 6 = 12
12 - 6 = 6

Family of Facts
9 + 4 = 13
4 + 9 = 13
13 - 4 = 9
13 - 9 = 4
8 + 5 = 13
5 + 8 = 13
13 - 5 = 8
13 - 8 = 5
7 + 6 = 13
6 + 7 = 13
13 - 6 = 7
13 - 7 = 6

Family of Facts		
9 + 5 = 14		
5 + 9 = 14		
14 - 5 = 9		
14 - 9 = 5		
8 + 6 = 14		
6 + 8 = 14		
14 - 6 = 8		
14 - 8 = 6		
7 + 7 = 14		
14 - 7 = 7		

Family of Facts		
9 + 6 = 15		
6 + 9 = 15		
15 - 6 = 9		
15 - 9 = 6		
8 + 7 = 15		
7 + 8 = 15		
15 - 7 = 8		
15 - 8 = 7		
9 + 7 = 16		
7 + 9 = 16		
16 - 7 = 9		
16 - 9 = 7		

Family of Facts		
8 + 8 = 16		
16 - 8 = 8		
9 + 8 = 17		
8 + 9 = 17		
17 - 8 = 9		
17 - 9 = 8		
9 + 9 = 18		
18 - 9 = 9		

1 to 100 Number Matrix:

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
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

Multiplication & division facts presented in this resource.

2x			
1	x	2	= 2
2	x	2	= 4
3	x	2	= 6
4	x	2	= 8
5	x	2	= 10
6	x	2	= 12
7	x	2	= 14
8	x	2	= 16
9	x	2	= 18
10	x	2	= 20

2x			
2	÷	2	= 1
4	÷	2	= 2
6	÷	2	= 3
8	÷	2	= 4
10	÷	2	= 5
12	÷	2	= 6
14	÷	2	= 7
16	÷	2	= 8
18	÷	2	= 9
20	÷	2	= 10

10x			
1	x	10	= 10
2	x	10	= 20
3	x	10	= 30
4	x	10	= 40
5	x	10	= 50
6	x	10	= 60
7	x	10	= 70
8	x	10	= 80
9	x	10	= 90
10	x	10	= 100

10x			
10	÷	10	= 1
20	÷	10	= 2
30	÷	10	= 3
40	÷	10	= 4
50	÷	10	= 5
60	÷	10	= 6
70	÷	10	= 7
80	÷	10	= 8
90	÷	10	= 9
100	÷	10	= 10

3x			
1	x	3	= 3
2	x	3	= 6
3	x	3	= 9
4	x	3	= 12
5	x	3	= 15
6	x	3	= 18
7	x	3	= 21
8	x	3	= 24
9	x	3	= 27
10	x	3	= 30

3x			
3	÷	3	= 1
6	÷	3	= 2
9	÷	3	= 3
12	÷	3	= 4
15	÷	3	= 5
18	÷	3	= 6
21	÷	3	= 7
24	÷	3	= 8
27	÷	3	= 9
30	÷	3	= 10

5x			
1	x	5	= 5
2	x	5	= 10
3	x	5	= 15
4	x	5	= 20
5	x	5	= 25
6	x	5	= 30
7	x	5	= 35
8	x	5	= 40
9	x	5	= 45
10	x	5	= 50

5x			
5	÷	5	= 1
10	÷	5	= 2
15	÷	5	= 3
20	÷	5	= 4
25	÷	5	= 5
30	÷	5	= 6
35	÷	5	= 7
40	÷	5	= 8
45	÷	5	= 9
50	÷	5	= 10

4x			
1	x	4	= 4
2	x	4	= 8
3	x	4	= 12
4	x	4	= 16
5	x	4	= 20
6	x	4	= 24
7	x	4	= 28
8	x	4	= 32
9	x	4	= 36
10	x	4	= 40

4x			
4	÷	4	= 1
8	÷	4	= 2
12	÷	4	= 3
16	÷	4	= 4
20	÷	4	= 5
24	÷	4	= 6
28	÷	4	= 7
32	÷	4	= 8
36	÷	4	= 9
40	÷	4	= 10

6x			
1	x	6	= 6
2	x	6	= 12
3	x	6	= 18
4	x	6	= 24
5	x	6	= 30
6	x	6	= 36
7	x	6	= 42
8	x	6	= 48
9	x	6	= 54
10	x	6	= 60

6x			
6	÷	6	= 1
12	÷	6	= 2
18	÷	6	= 3
24	÷	6	= 4
30	÷	6	= 5
36	÷	6	= 6
42	÷	6	= 7
48	÷	6	= 8
54	÷	6	= 9
60	÷	6	= 10

7x			
1	x	7	= 7
2	x	7	= 14
3	x	7	= 21
4	x	7	= 28
5	x	7	= 35
6	x	7	= 42
7	x	7	= 49
8	x	7	= 56
9	x	7	= 63
10	x	7	= 70

7x			
7	÷	7	= 1
14	÷	7	= 2
21	÷	7	= 3
28	÷	7	= 4
35	÷	7	= 5
42	÷	7	= 6
49	÷	7	= 7
56	÷	7	= 8
63	÷	7	= 9
70	÷	7	= 10

8x			
1	x	8	= 8
2	x	8	= 16
3	x	8	= 24
4	x	8	= 32
5	x	8	= 40
6	x	8	= 48
7	x	8	= 56
8	x	8	= 64
9	x	8	= 72
10	x	8	= 80

8x			
8	÷	8	= 1
16	÷	8	= 2
24	÷	8	= 3
32	÷	8	= 4
40	÷	8	= 5
48	÷	8	= 6
56	÷	8	= 7
64	÷	8	= 8
72	÷	8	= 9
80	÷	8	= 10

9x			
1	x	9	= 9
2	x	9	= 18
3	x	9	= 27
4	x	9	= 36
5	x	9	= 45
6	x	9	= 54
7	x	9	= 63
8	x	9	= 72
9	x	9	= 81
10	x	9	= 90

9x			
9	÷	9	= 1
18	÷	9	= 2
27	÷	9	= 3
36	÷	9	= 4
45	÷	9	= 5
54	÷	9	= 6
63	÷	9	= 7
72	÷	9	= 8
81	÷	9	= 9
90	÷	9	= 10

