McLaren High School

Numeracy Booklet

Order | Respect | Care | Achievement

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1. Calculating Methods

Addition

Example: 534 + 2678

Place the digits in the correct "place value" columns with the numbers under each other. Begin adding in the units column.

Show any carrying in the next column.

	Th	H	T	U
		5	3	4
+	$_1$2	$_1$6	$_1$7	8
	3	2	1	2

Subtraction

Example: 7689 - 749

Place the digits in the correct "place value" columns with the numbers under each other.

Begin subtracting in the units column.

You can't subtract 9 from 6 so move 1 ten from the 8 tens to the 6 units to make 16 units.

Note that the same has happened with the hundreds.

	Th	H	T	U
	^{6}~~7~~	^{1}6	^{7}~~8~~	^{1}6
-		7	4	9
	6	9	3	7

Multiplication

Example: 56 x 34

Multiply the 56 by 4

On the second line put a zero in the units column
Multiply the 56 by 3
Add the 2 rows together

```
  56
 x34
 ---
 224
1680
----
1904
```

Alternative Method

Separate the 56 and 34 into tens and units.

Multiply the columns with the rows and place the answers in the grey boxes.

x	50	6
30	1500	180
4	200	24

Add the numbers: 1500 + 180 + 200 + 24
= 1904

Division

Example: 432 ÷ 15

Long division method

		2	8	4 is not divisible by 15, so you divide 43 by 15.
15	4	3	2	3 x 15 = 45 which is more than 43 so choose 2 x 15 = 30.
	3	0	↓	Subtract 30 from 43 to give a remainder of 13.
	1	3	2	Bring the 2 down in order to make 132.
	1	2	0	8 x 15 = 120.
		1	2	Subtract 120 from 132 to give a remainder of 12.

There are no more numbers to bring down, therefore, the answer is:

28 r 12 — 28 with a remainder of 12.

Concise Method

		2	8	r12
15	4	3	$^{13}2$	

4 is not divisible by 15, so you divide 43 by 15.
3 x 15 = 45 which is more than 43 so choose 2 x 15 = 30.
Subtract 30 from 43 to give a remainder of 13.
Write 13 in front of the 2 to give 132.
8 x 15 = 120.
Subtract 120 from 132 to give a remainder of 12.
Therefore, the answer is: 28 r 12

2. Order of Operations (BODMAS)

Calculations which involve more than one operation (addition, subtraction, multiplication or division) have to be completed in a specific order.

For example, what is the value of 3 + 5 x 2?

Two suggestions are: 8 x 2 = 16 and 3 + 10 = 13

Calculating 3 + 5 first (8 x 2 = 16); Calculating 5 x 2 first (3 + 10 = 13)

The correct answer is 13.

The mnemonic BODMAS helps us to remember the correct order to do calculations in.

Brackets
Of
Division
Multiplication
Addition
Subtraction

Brackets means tidy up anything inside brackets whilst the "of" refers to fractions and percentages (see later). Finally, the division and multiplication have equal priority as do the addition and subtraction.

From the example above, BODMAS tells us that we must do the multiplication 5 x 2 before adding the answer to the 3.

Scientific calculators are generally programmed to follow these rules, however basic calculators may not and therefore caution must be exercised when using them.

Examples:

1. 25 – 18 ÷3	division first
= 25 – 6	then subtraction
= 19	
2. 4 +(3 + 8) x 2	brackets first
= 4 + 11 x 2	then multiplication
= 4 + 22	then addition
= 26	
3. 30 – (2^2 + 1) x 3 + 4	brackets first (2^2 = 2 x 2)
= 30 – 5 x 3 + 4	then multiplication
= 30 – 15 + 4	addition and subtraction have equal priority so
= 15 + 4	do either next then the last one
= 19	

3. Special Numbers

Even numbers

2, 4, 6, 8, 10, 12, …………
2 divides exactly into every even number.

Odd numbers

1, 3, 5, 7, 11, …………
2 doesn't divide exactly into odd numbers.

Square numbers

$1^2 = 1 \times 1 = 1$
$2^2 = 2 \times 2 = 4$
$3^2 = 3 \times 3 = 9$
$4^2 = 4 \text{ X } 4 = 16$
$5^2 = 5 \text{ X } 5 = 25$
$6^2 = 6 \times 6 = 36$
$7^2 = 7 \times 7 = 49$

The first 7 square numbers are: 1, 4, 9, 16, 25, 36, 49

Triangular numbers

1	= 1
1 + 2	= 3
1 + 2 + 3	= 6
1 + 2 + 3 + 4	= 10
1 + 2 + 3 + 4 + 5	= 15
1 + 2 + 3 + 4 + 5 + 6	= 21
1 + 2 + 3 + 4 + 5 + 6 + 7	= 28

The first seven triangular numbers are:
1, 3, 6, 10, 15, 21, 28

Factors

A factor is a number that divides exactly into another number.
The factors of 12 are:
1, 2, 3 ,4, 6, 12

The factors of 13 are 1 and 13

Prime numbers

A prime number has exactly **two** factors namely 1 and itself.

The factors of 17 are 1 and 17, therefore 17 is a prime number.

The prime numbers between 1 and 100 are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

Note: 1 is not a prime number!

4. Place Value

Thousands (1000)	Hundreds (100)	Tens (10)	Units (1)	.	Tenths $\frac{1}{10}$	Hundredths $\frac{1}{100}$	Thousandths $\frac{1}{1000}$

10 units	=	1 ten	10 thousandths	=	1 hundredth
10 tens	=	1 hundred	10 hundredths	=	1 tenth
10 hundreds	=	1 thousand	10 tenths	=	1 unit

The placement of the digits within the number gives us the value of that digit.

The digit 4 has the value of 4 thousand (4000)

The digit 5 has the value of 5 tenths ($^{5}/_{10}$)

4 2 8 4 . 5 6 7

The digit 8 has the value 8 tens (80)

The digit 7 has the value 7 thousandths ($^{7}/_{1000}$)

5. Inverse Operations

Inverse operations allow you to undo a sum.

Operator	**Inverse Operator**
+	–
–	+
÷	x
x	÷

We use inverse operations when we work with function machines.

Input	?	→	÷ 3	→	– 7	=	3	Output
If the output is 3, the input ? must be 30.	30	=	x 3	←	+ 7	←	3	

6. Fractions

The numerator is the number on the top of the fraction

$$\frac{3}{4}$$

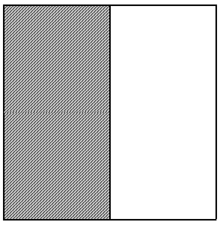
The denominator is the number on the bottom

If we have a number and a fraction mixed we call it a **mixed fraction.** $3\frac{7}{8}$

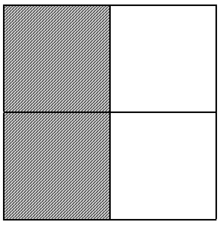
When the numerator is larger than the denominator we call this an **improper** fraction. $\frac{9}{7}$

Equivalent Fractions

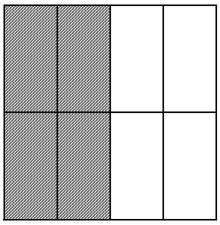
All the fractions below represent the same proportion. Therefore they are called equivalent fractions.



$^{1}/_{2}$



$^{2}/_{4}$



$^{4}/_{8}$

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \ldots.$$

$$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{4}{12} = \frac{5}{15} = \ldots.$$

$$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20} = \ldots.$$

$$\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16} = \frac{15}{20} = \ldots.$$

Worked Examples

Add and Subtract	Multiply	Divide
Make the denominators equal	Multiply top and multiply bottom	Invert the second fraction and multiply
$\frac{1}{2} + \frac{1}{3}$ $= \frac{3}{6} + \frac{2}{6}$ $= \frac{5}{6}$	$\frac{2}{3} \times \frac{3}{4}$ $= \frac{6}{12}$ $= \frac{1}{2}$	$\frac{3}{4} \div \frac{2}{5}$ $= \frac{3}{4} \times \frac{5}{2}$ $= \frac{15}{8} = 1\frac{7}{8}$

7. Decimals

A decimal is any number that contains a decimal point.
The following are examples of decimals.

0·549 1·25 256·4 3·406

8. Percentages

The symbol % means per cent or for every hundred.

7%	means	$^{7}/_{100}$	
63%	means	$^{63}/_{100}$	
100%	means	$^{100}/_{100}$	or 1 whole.
120%	means	$^{120}/_{100}$	It is possible to have a percentage that is greater than 1 whole.

Calculating a % of an Amount

Find 36% of £250
10% is £25
30% is £75 (10% x 3)
5% is £12.50 (10% ÷ 2)
1% is £2.50 (10% ÷ 10)
36% is £90 (30% + 5% + 1%)

To find a percentage of an amount Without a calculator: Find 10%, 5 % and 1% first
With a calculator 36 ÷ 100 x 250

Changing Decimals and Fractions into Percentages

To change a decimal or fraction to a percentage you have to **multiply** by 100.

$0{\cdot}75 \times 100 = 75\%$

$\frac{13}{{}_1\cancel{20}} \times {}^5\cancel{100} = 65\%$

To change a fraction into a decimal you have to **divide** the numerator with the denominator.

$\frac{3}{8} = 3 \div 8 = 0{\cdot}375$

It is also possible to change a fraction into a percentage like this:

$\frac{2}{3} = 2 \div 3 = 0{\cdot}6666\ldots = 0{\cdot}67$ (to 2 decimal places)

then $0{\cdot}67 \times 100 = 67\%$

Therefore $\frac{2}{3} = 67\%$ (to the nearest one part of a hundred)

Express two fifths as a percentage

$\frac{2}{5}$	=	$\frac{4}{10}$	=	$\frac{40}{100}$	=	40%

You buy a car for £5000 and sell it for £3500. What is the percentage loss?

Loss = £5000 - £3500 = £1500

$\frac{1500}{5000}$	=	$\frac{15}{50}$	=	$\frac{30}{100}$	=	30%

Increase £350 by 15%

15% of 350 = 350 ÷ 100 x 15 = £52.50 (…to find the increase) (then add on for the new total…) £350 + £52.50 = £402.50

WE DO NOT …. use the % button on the calculator because of inconsistencies between models

Useful Fractions, Decimals and Percentages

Fraction	Decimal	Percentage
1	1·0	100%
$^{1}/_{2}$	0·5	50%
$^{1}/_{3}$	0·33	33%
$^{1}/_{4}$	0·25	25%
$^{3}/_{4}$	0·75	75%
$^{1}/_{10}$	0·1	10%
$^{2}/_{10}$ (= $^{1}/_{5}$)	0·2	20%
$^{3}/_{10}$	0·3	30%

9. Ratio

Ratio is used to make a comparison between two things.

Example

☺ ☺ ☺ ☹ ☺ ☺ ☺ ☹ ☺ ☺ ☺ ☹

In this pattern we can see that there are 3 happy faces **to** every sad face.
We use the symbol : to represent **to** in the above statement, therefore we write the ratio like this:

Happy	:	Sad		Sad	:	Happy
3	:	1		1	:	3

Ratio is used in a number of situations:

- In a cooking recipe
- In building when mixing concrete
- It is used in the scale of maps
  e.g. if a scale of **1 : 100 000** is used,
  it means that **1 cm** on the map represents
  100 000 cm in reality which is **1 km**.

Applications of Ratios

Ratios can be used to calculate unknown quantities or to distribute an amount accordingly.

Examples

1. To make a diluting juice drink the manufacturers suggest the ratio of concentrate to water is 1:5. How much concentrate is required for 30 litres of water?

Answer: <u>concentrate</u> <u>water</u>

concentrate		water
1	:	5
6	:	30

30 ÷ 5 = 6 so we mutiply both sides of the ratio by 6.

Therefore, 6 litres of concentrate is required.

2. The ratio of a model aeroplane to the actual aeroplane is 1:50.
   (a) If the model plane has a wing span of 20cm, what is the length of the wing span on the real plane?
   (b) The real plane has length 25m, what length is the model plane?

Answers:

(a) <u>model</u> : <u>real</u>

model		real
1	:	50
20	:	1000

20 ÷1 = 20 so we multiply both sides of the ratio by 20.

The wingspan of the aeroplane is 1000cm = 10m.

(b) <u>model</u> : <u>real</u>

model		real
1	:	50
0.5	:	25

25 ÷ 50 = 0.5 so we multiply both sides of the ratio by 0.5.

The length of the model aeroplane is 0.5m = 50cm

3. A lottery win of £500,000 is shared amongst Janine, Mhairi and Sarah in the ratio 3:5:2. How much does each person receive?

Answer:

The ratio has to be split into 10 parts altogether (3+5+2 = 10) so
1 part = 500,000 ÷10
= £50,000

The ratio tells us that Janine gets 3 parts = 3 x 50,000 = £150,000; Mhairi gets 5 parts = 5 x 50,000 = £250,000 and Sarah gets 2 parts = 2 x 50,000 = £100,000. It can be useful to show this in a table:

Janine	:	Mhairi	:	Sarah	
3	:	5	:	2	x 50,000
150,000	:	250,000	:	100,000	

10. Directed Numbers

The negative sign (-) tells us the number is less than zero e.g. **-4**. The number line is useful when working with negative numbers. Below is a part of the number line.

Negative direction ← → Positive direction

-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6

The numbers on the right are greater than the numbers on the left e.g. 5 is greater than 2 and 2 is greater than -3. **Note** that -3 is greater than -8.

Examples

1) 4 + (-6) 2) -7 + (-8) 3) -11 + (-5) 4) 6 – (-4) 5) -3 – (-5) 6) -8 – (-2)

What is the difference in temperature between -14ºC and -51ºC?
-14 – (-51)
= -14 + 51
= 37ºC

Multiplying and Dividing Directed Numbers

We multiply and divide directed numbers in the usual way whilst remembering these very important rules:

Two signs the same, a positive answer.
Two different signs, a negative answer.

x	+	-
+	+	-
-	-	+

÷	+	-
+	+	-
-	-	+

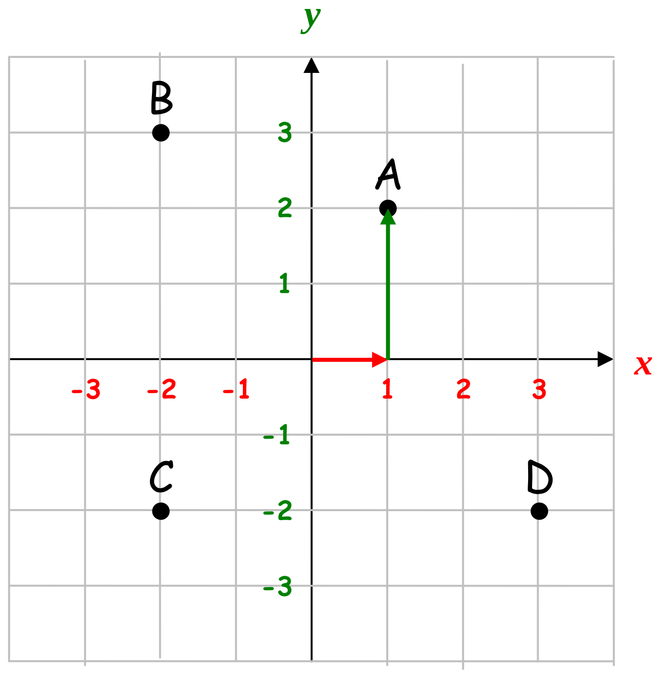
Remember, if there is no sign before the number, it is positive.

Examples:

5	x	-7	=	-35	(different signs give a negative answer)
-4	x	-8	=	32	(two signs the same give a positive answer)
48	÷	-6	=	-8	(different signs give a negative answer)
-120	÷	-10	=	12	(two signs the same give a positive answer)

11. Coordinates

We use coordinates to describe location.



The coordinates of the points are:

A (1,2) **B (-2,3)** **C (-2,-2)** **D (3,-2)**

There is a special name for the point **(0,0)** which is **the origin**.

The first number (**x-coordinate**) represents the distance horizaontally (left or right) from the origin. The second number (**y-coordinate**) represents the distance going up or down.

Example: The point (**1**,**2**) is **one across** and **two up** from the origin.

12. Equations

An equation is a mathematical statement linking two things which are equal. When dealing with an equation it is important that it remains equal (or balanced) at all times, i.e. if you change one side then you must do the same to the other side so that both sides remain the same. There should only be one equals sign on every line of an equation and they should be aligned one above the other.

It is a good idea to check an equation by substituting the final answer back in to the original problem.

Examples

Solve for x: (this means you want x on its own)

1. $2x + 3 = 21$

$2x + 3 = 21$ (balance by subtracting 3 from both sides)
$2x = 18$ (balance by dividing both sides by 2)
$x = 9$ (final answer)

Check: LHS = 2 x 9 + 3 = 21 = RHS so correct

2. $4x – 7 = 37$

$4x – 7 = 37$ (add 7 to both sides)
$4x = 44$ (divide both sides by 4)
$x = 11$

Check: LHS = 4 x 11 – 7 = 37 = RHS so correct

3. $3x – 5 = x + 15$

$3x – 5 = x + 15$ (subtract x from both sides)
$2x – 5 = 15$ (add 5 to both sides)
$2x = 20$ (divide both sides by 2)
$x = 10$

Check: LHS = 3 x 10 – 5 = 25
RHS = 11 + 15 = 25
LHS = RHS so correct

13. Formulae

Evaluating Formulae

To evaluate a formula we substitute numbers in for letters.

Example

1. The formula to convert temperature from degrees Celsius, C, to Fahrenheit, F is $F = 1.8C + 32$. What temperature is 20°C in Fahrenheit?

   In this example, $C = 20$ so $F = 1.8C + 32$
   $= 1.8C \times 20 + 32$
   $= 68°F$

Rearranging Formulae

To change the subject of a formula is to rearrange it to have a different letter on its own on one side of the equation. To rearrange a formula we "work backwards", ensuring that the formula remains balanced at all times.

Examples

1. F or $F = 1.8C + 32$, make C the subject of the fomula
   $F = 1.8C + 32$ (subtract 32 from both sides)
   $F - 32 = 1.8C$ (divide both sides by 1.8)
   $(F-32) \div 1.8 = C$
   $C = (F - 32) \div 1.8$ (Write new subject of the formula on LHS of equation)

2. Make c the subject of the formula $a^2 = b^2 + c^2$

   $a^2 = b^2 + c^2$ (subtract b^2 from both sides)
   $a^2 - b^2 = c^2$
   $c = \sqrt{(a^2 - b^2)}$

   (Take the square root of both sides recalling that either a positive or negative solution may exist).

14. Inequalities

We use the **=** sign to show that two sums are **equal**. If one sum is greater than or less than the other we use inequalities:

< less than	**>** more than
$\leq$ less than or equal to	$\geq$ more than or equal to

Examples :

5 < 8	**43 > 6**	***x*** **$\leq$ 8**	***y*** **$\geq$ 17**
less than	more than	less than or equal to	more than or equal to

15. Scientific Notation

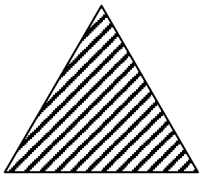
A number in scientific notation consists of a number between one and ten multiplied by 10 to some power.

Example:

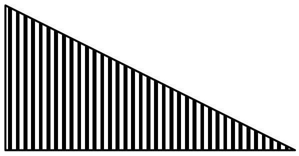
24,500,000	=	2.45×10^{7}
0.000988	=	9.88×10^{-4}

16. Two Dimensional Shapes

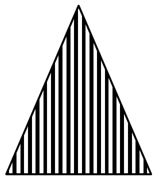
A polygon is a closed shape made up of straight lines.
A **regular polygon** has equal sides and equal angles.



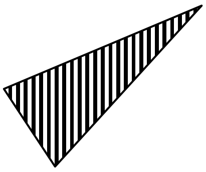
Equilateral triangle



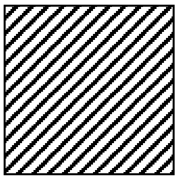
Right angled triangle



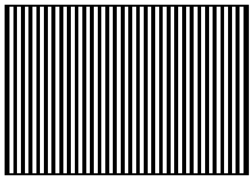
Isosceles triangle



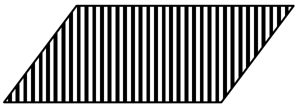
Scalene triangle



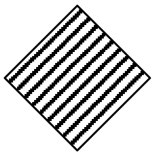
Square



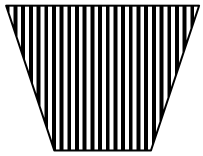
Rectangle



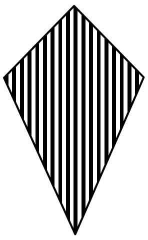
Parallelogram
Opposite sides parallel and equal.



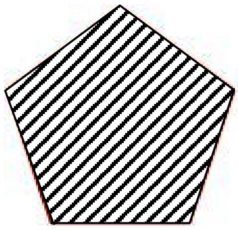
Rhombus
Opposite sides parallel, all sides equal.



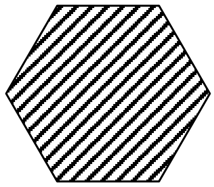
Trapezium
One pair of opposite sides parallel.



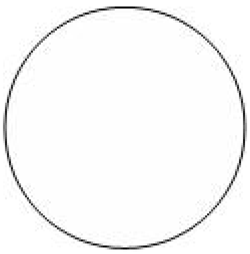
Kite



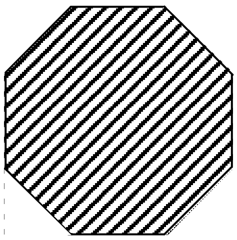
Pentagon



Hexagon

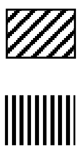


Circle



Octagon

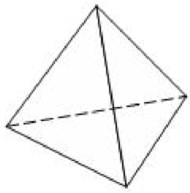
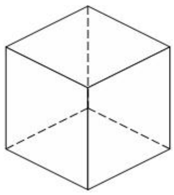
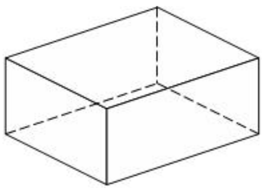
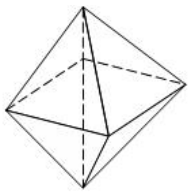
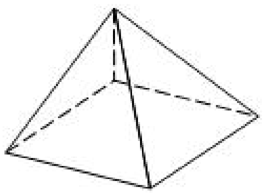
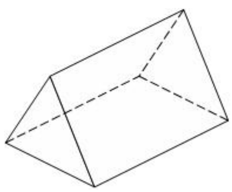
Key



regular polygon
irregular polygon

17. 3D Shapes

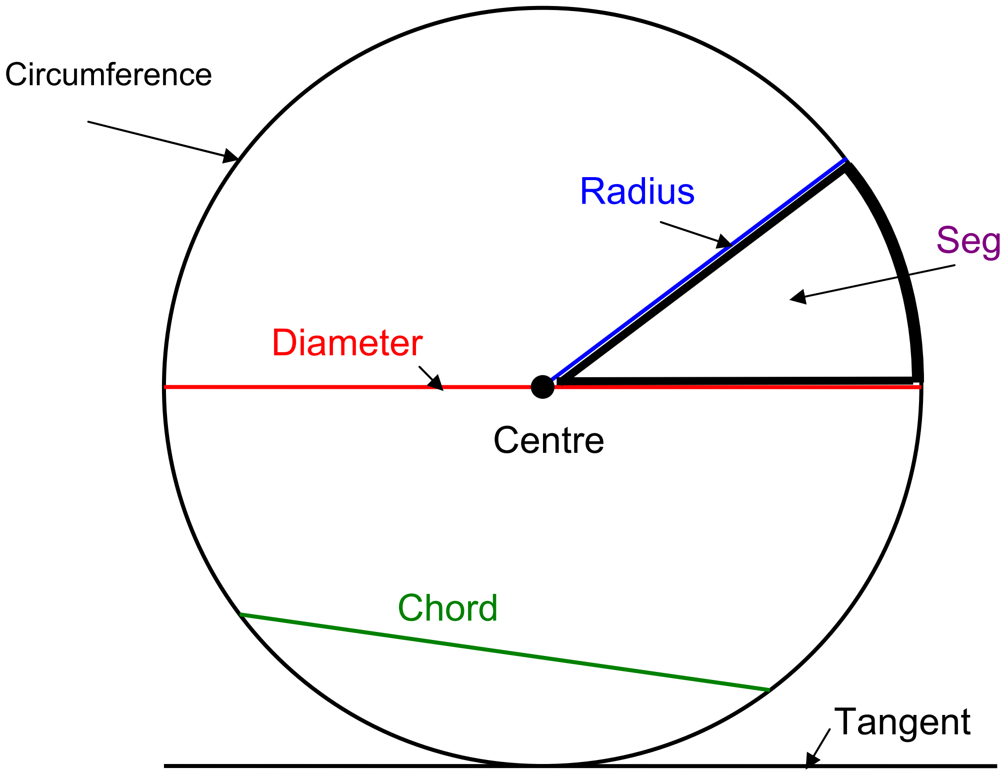
3D means three dimensions – 3D shapes have length, width and height.

Shape	Name	Faces	Edges	Vertices (corners)
	Tetrahedron	4	6	4
	Cube	6	12	8
	Cuboid	6	12	8
	Octahedron	8	12	6
	Square based pyramid	5	8	5
	Triangular prism	5	9	6

Euler's formula:

Number of faces - Number of edges + Number of vertices = 2

18. The Circle



Circumference of a Circle

π is a Greek letter which represents 3•14159265358979323 84 . . . . . (a decimal that carries on for ever without repetition)

We round π to 3•14 in order to make calculations or we use the π button on the calculator.

The circumference of a circle is the distance around the circle.

Circumference = π x diameter

Circumference = πd

Since the the diameter is **twice** the length of the radius, we can also write

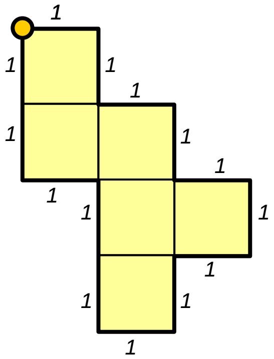
Circumference = π x 2 x radius

or Circumference = 2πr

π (pi)

19. Perimeter

Perimeter is the distance around the outside of a shape. We measure the perimeter in millimetres (mm), centimetres (cm), metres (m), etc.



This shape has been drawn on a 1cm grid. Starting at the top left and moving in a clockwise direction, the distance travelled is . . .

1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 2 + 1 + 2 = 14cm

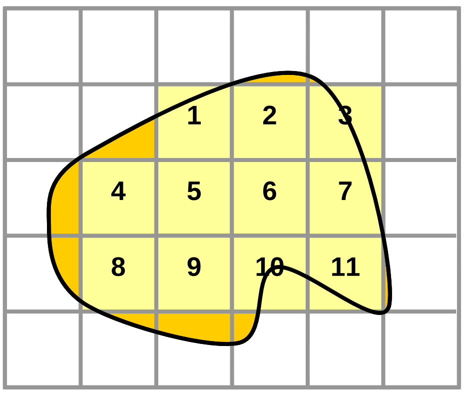
Perimeter = 14cm

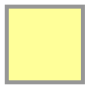
20. Area of 2D Shapes

The area of a shape is a measure of how much surface it covers. We measure area in square units e.g. centimetres squared (cm^2) or metres squared (m^2) etc.

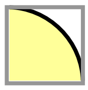
Areas of Irregular Shapes

Given an irregular shape, we estimate its area by drawing a grid and counting the squares that cover the shape.

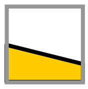




Whole square – count as one.



Half a square or more – count as one.



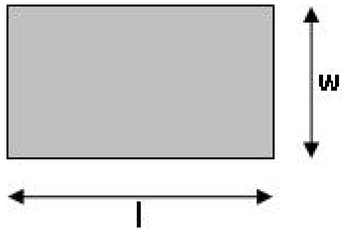
Less than half a square - ignore.

Area = $11cm^2$.

Remember that this is an estimate and not the exact area.

Area Formulae

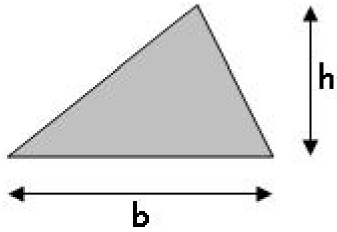
Rectangle



Multiply the length with the breadth.

Area = l x b

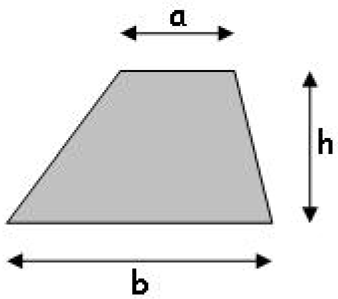
Triangle



Multiply the base with the height and divide by two.

Area = $\frac{b \times h}{2}$

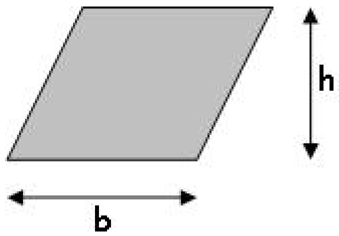
Trapezium



Add the parallel sides, multiply with the height and divide by two.

Area = $\frac{(a + b)\,h}{2}$

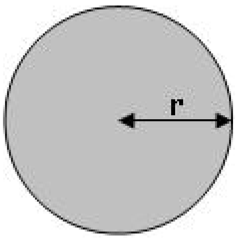
Parallelogram



Multiply the base with the height.

Area = b x h

Circle



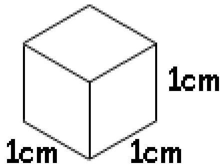
Multiply the radius with itself, then multiply with π.

Area = $r \times r \times \pi = \pi r^2$

21. Volume

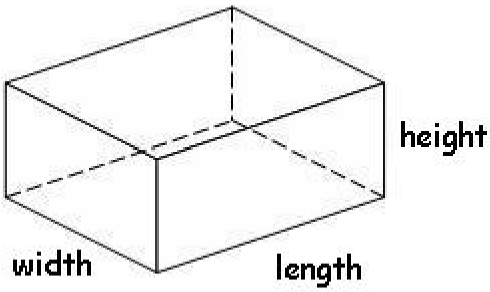
Volume is the amount of space that an object contains or takes up. The object can be a solid, liquid or gas.

Volume is measured in cubic units e.g. cubic centimetres (cm^3) and cubic metres (m^3) etc.



Cuboid

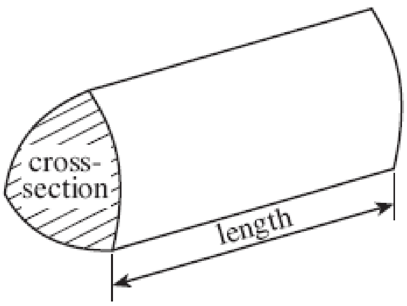
Note that a cuboid has six rectangular faces.



Volume of a cuboid = length x width x height

Prism

A prism is a 3-dimensional object that has the same shape throughout its length i.e. it has a uniform cross-section.



Volume of a prism = area of cross-section x length

22. Measurement

Metric Units of Length

Millimetre	mm	10 mm = 1 cm 1 000 mm = 1 m
Centimetre	cm	100 cm = 1 m 100 000 cm = 1 km
Metre	m	1 000 m = 1 km
Kilometre	km	

Imperial Units of Length

Inch	in or ″	12 in = 1 ft
Foot	ft or ′	3 ft = 1 yd
Yard	yd	1 760 yd = 1 mile
Mile		

Metric Units of Mass

Milligram	mg	1 000 mg = 1 g 1 000 000 mg = 1 kg
Gram	g	1 000 g = 1 kg
Kilogram	kg	1 000 kg = 1 t
Metric tonne	t	

Imperial Units of Mass

Ounce	oz	16 oz = 1 lb
Pound	lb	14 lb = 1 st
Stone	st	160 st = 1 t

Metric Units of Volume

Millilitre	ml	1 000 ml = 1 l
Litre	l	

Imperial Units of Volume

Pint	pt	8 pt = 1 gal
Gallon	gal	

Converting Between Imperial and Metric Units

Length

1 inch	≈	2.5 cm
1 foot	≈	30 cm
1 mile	≈	1.6 km
5 miles	≈	8 km

Weight/Mass

1 pound	~	454 g
2.2 pounds	~	1 kg
1 ton	~	1 metric tonne

Volume

1 gallon	≈	4.5 litre
1 pint	≈	0.6 litre(568 ml)
1¾ pints	≈	1 litre

23. Temperature

Converting from Celsius (°C) to Fahrenheit (°F)

Use the following formula

F = 1.8 x C + 32

Converting from Fahrenheit (°F) to Celsius (°C)

Use the following formula

C = (F – 32) ÷ 1.8

The freezing point of water is 0°C or 32°F

The boiling point of water is 100°C or 212°F

24. Time

1000	years	=	1 millennium
100	years	=	1 century
10	years	=	1 decade
60	seconds	=	1 minute
60	minutes	=	1 hour
24	hours	=	1 day
7	days	=	1 week
12	months	=	1 year
52	weeks	≈	1 year
365	days	≈	1 year
366	days	≈	1 leap year

12 and 24 hour Clock

Time is measured using either the 12 or 24 hour clock. When using the 12 hour clock a.m. represents from midnight to noon and p.m. from noon to midnight. Times written using the 24 hour clock require 4 digits ranging from 00:00 to 23:59. Midnight is expressed as 00:00; 12 noon is written as 12:00 as 12 hours have passed to reach midday and the hours thereafter are 13:00, 14:00, 15:00, etc until midnight.

Examples

12 hour	→	**24 hour**
6.03 a.m.		06:03
Noon (12pm)		12:00
7.48 p.m.		19:48
Midnight (12am)		00:00

Time Intervals

We do not teach time as a subtraction, instead pupils are expected to “add on”.

Example

Converting Minutes to Hours

To convert from minutes to hours we write the minutes as a fraction of an hour.

Example Write 48 minutes in hours

$$\frac{48}{60} = 48 \div 60$$

$$= 0.8 \text{ hours}$$

Stopwatch Times

In general, stopwatches read hours : minutes : seconds : hundredths of a second.

Example 02:34:53.91
This stopwatch reading represents a time of 2 hours 34 minutes 53 seconds and 91 hundredths of a second (not milliseconds!).

The Yearly Cycle

Month	Days
January	31
February	28
March	31
April	30
May	31
June	30
July	31
August	31
September	30
October	31
November	30
December	31