



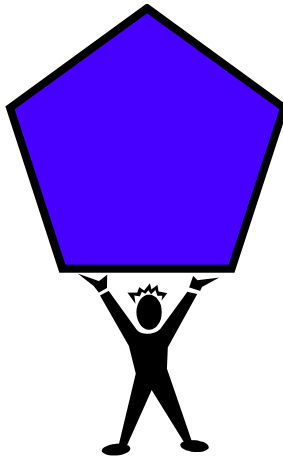
Rogers Maths Reference Booklet

GCSE Maths (Stoke On Trent College)



STOKE
ON
TRENT
COLLEGE

Roger's Maths Reference Booklet



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Maths Terms

Addition	Subtraction	Multiplication	Division
+	-	X	÷
Add	Decrease	Groups of	Divide
Increase	Difference	Lots of	Group
More	Less than	Multiply	Share
Plus	Minus	Product	
Sum	Reduce	Sets of	
Total	Subtract	Times	
	Take away		

Numbers in Words and Digits

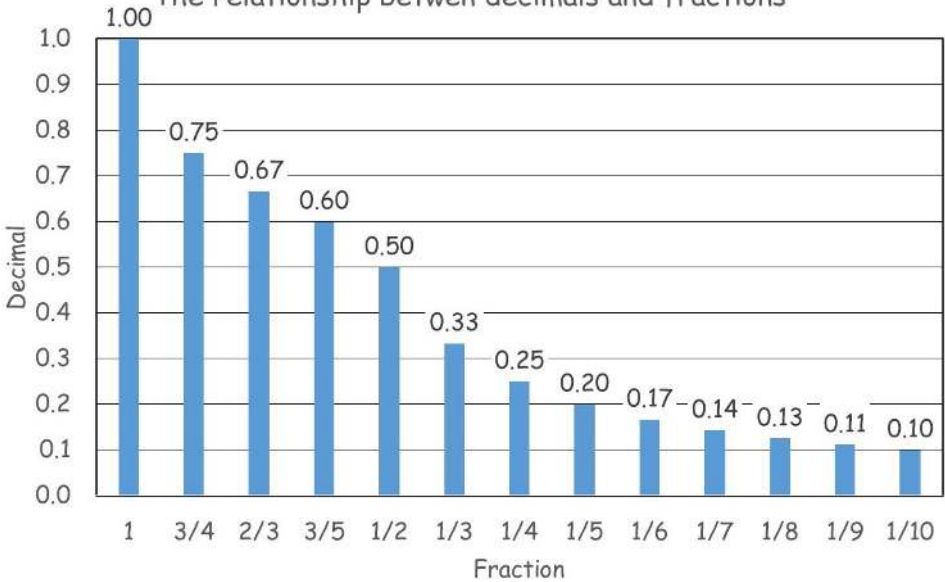
Number	M	HT	TT	T	H	T	U
One							1
Ten						1	0
One hundred					1	0	0
One thousand				1	0	0	0
Ten thousand			1	0	0	0	0
One hundred thousand		1	0	0	0	0	0
One million	1	0	0	0	0	0	0

To make numbers bigger than 999 easier to read commas are often put between the thousands:

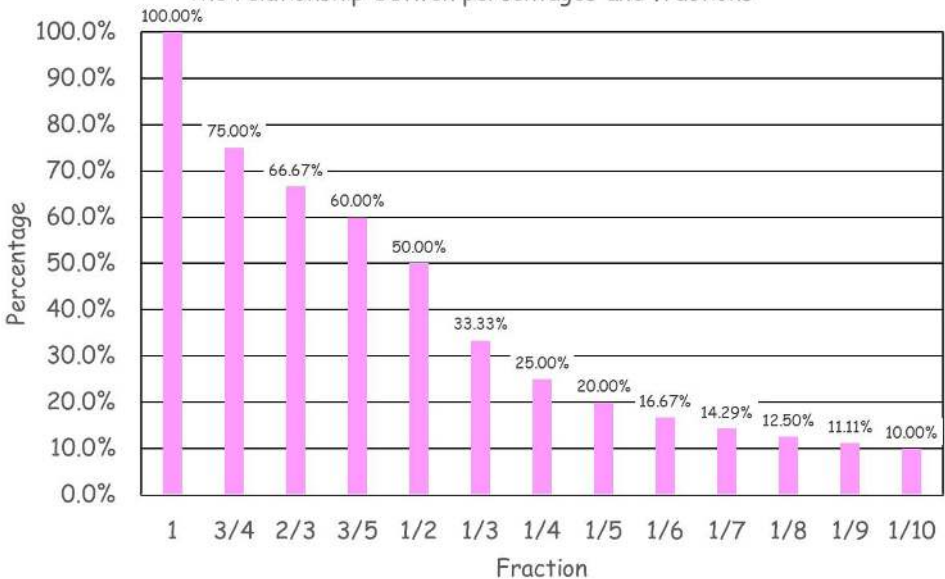
Number written in words	Written in digits
One thousand	1,000
Ten thousand	10,000
One hundred thousand	100,000
One million	1,000,000
Ten million	10,000,000
One hundred million	100,000,000
One billion	1,000,000,000
One trillion	1,000,000,000,000

Fractions, Decimals and Percentages

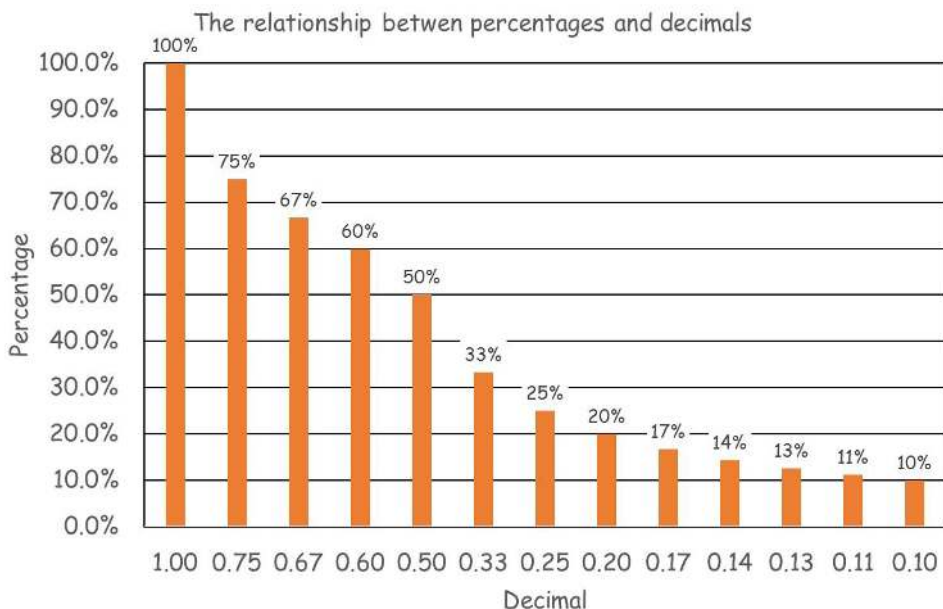
The relationship between decimals and fractions



The relationship between percentages and fractions



Fractions, Decimals and Percentages



Converting between
fractions, decimals and percentages

From	to	Method
Fraction	Decimal	Divide the top number by the bottom
Fraction	Percentage	Divide the top number by the bottom and multiply by 100
Decimal	Percentage	Multiply by 100
Percent	Decimal	Divide by 100

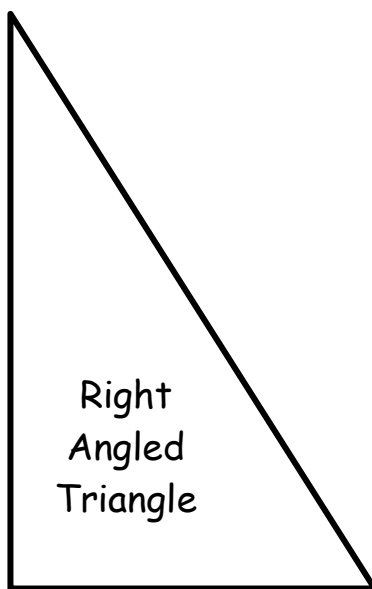
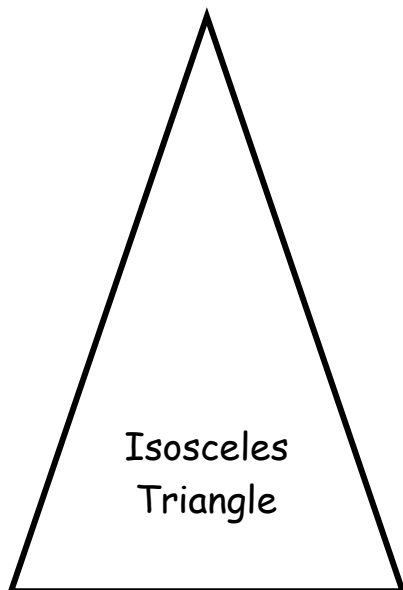
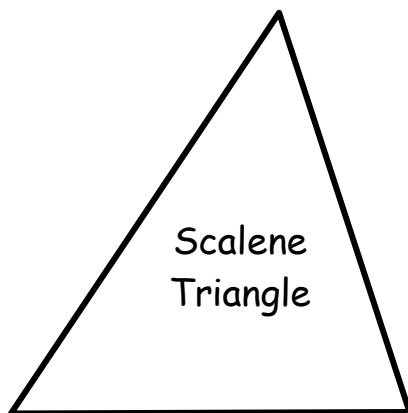
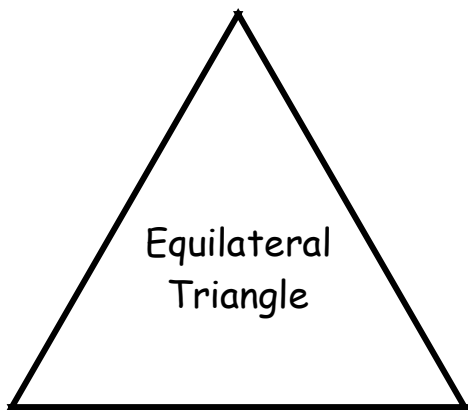
Number Square

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

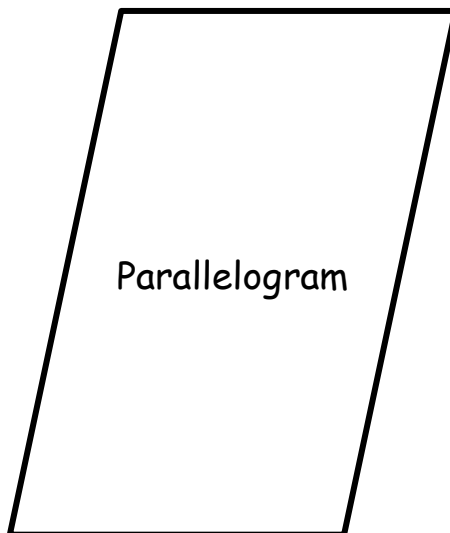
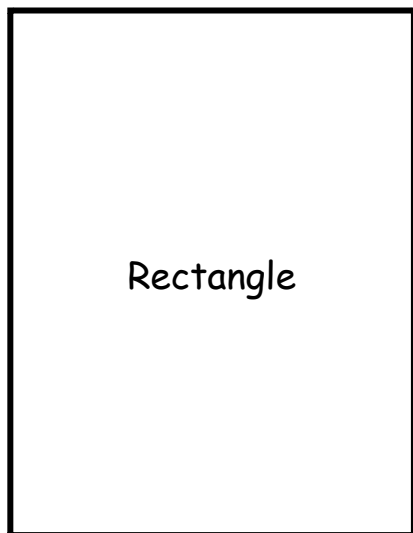
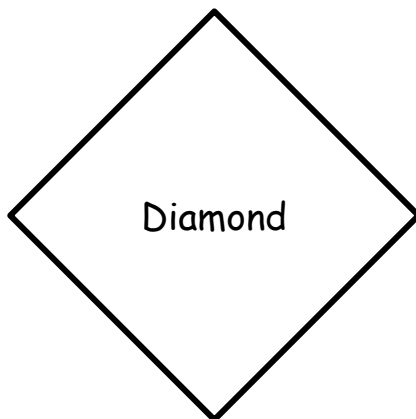
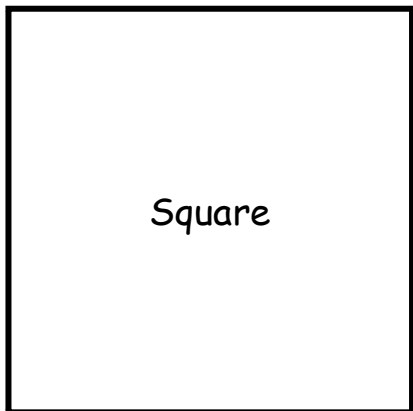
Tables Square

X	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

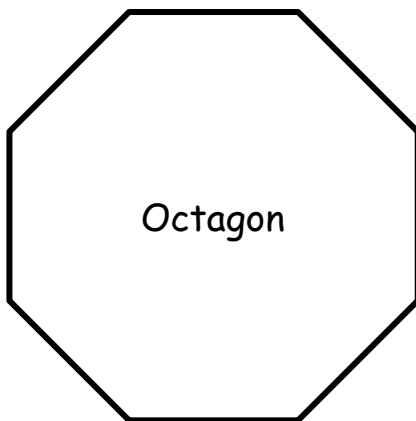
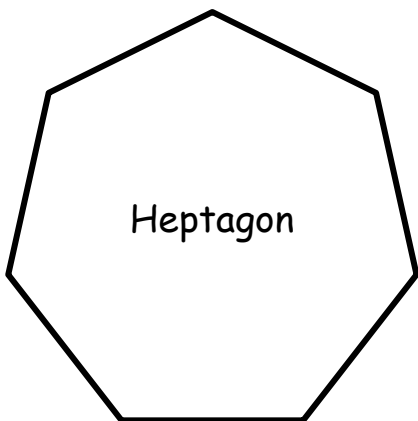
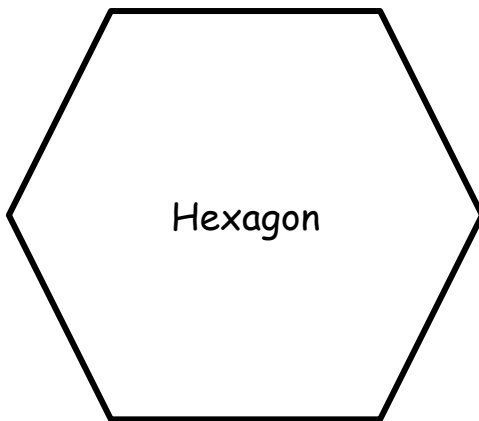
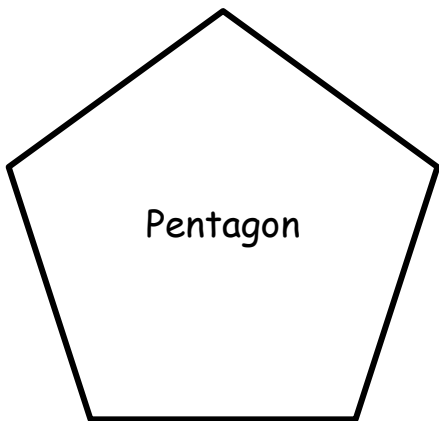
Shapes



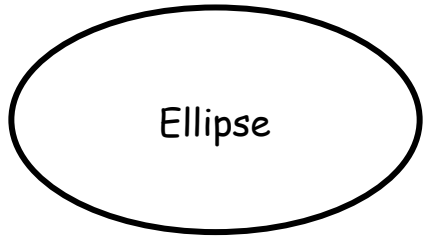
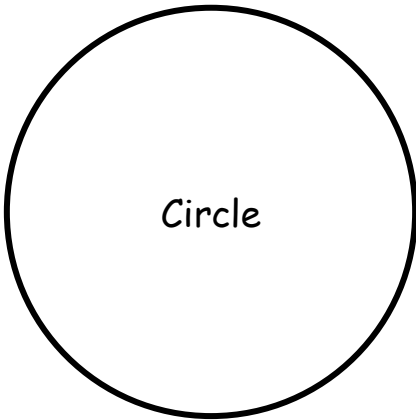
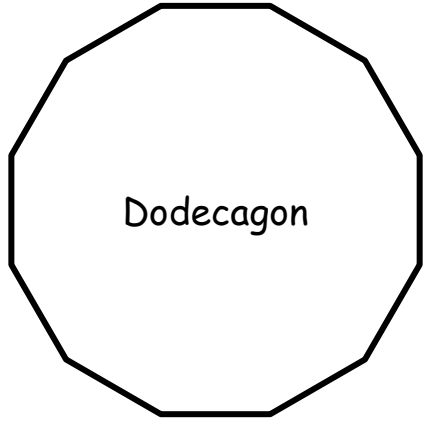
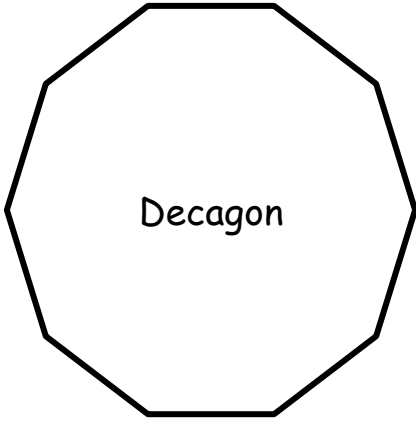
Shapes



Shapes

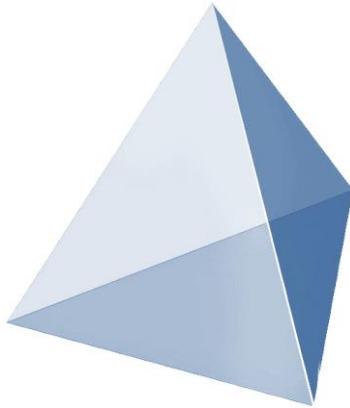


Shapes

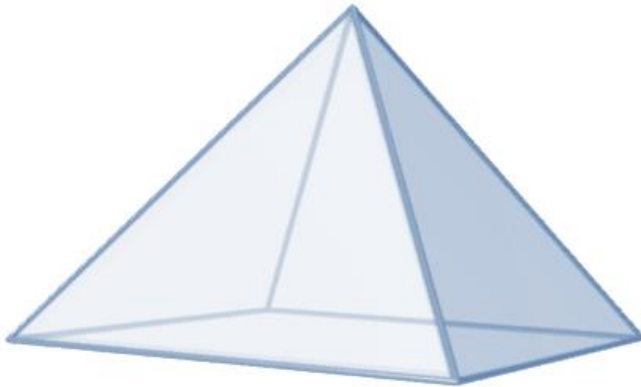


Solids

(Images adapted from <http://commons.wikimedia.org>)



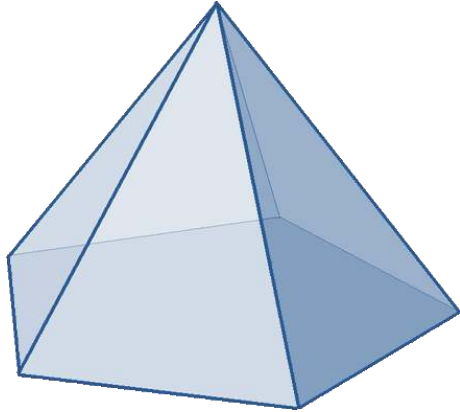
Tetrahedron



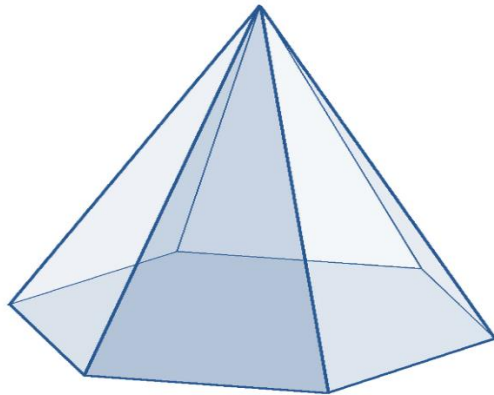
Square Based Pyramid

Solids

(Images adapted from <http://commons.wikimedia.org>)



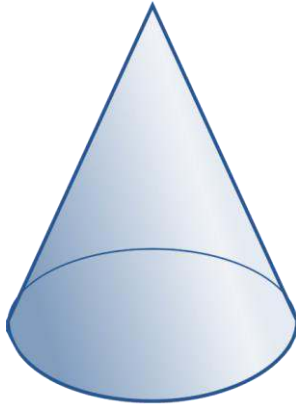
Pentagonal Based Pyramid



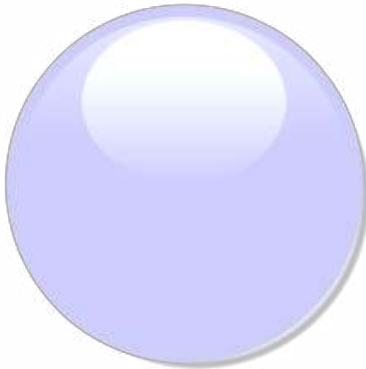
Hexagonal Based Pyramid

Solids

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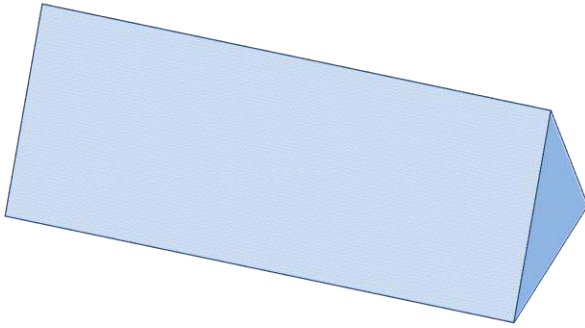


Cone

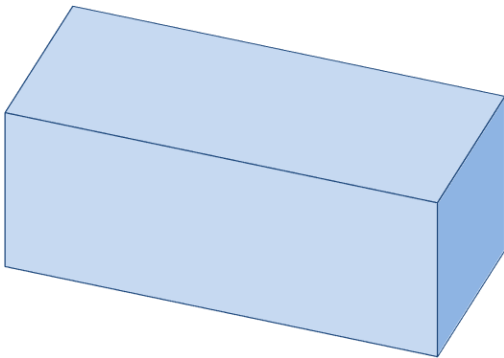


Sphere

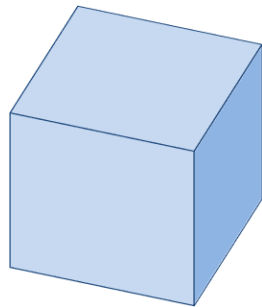
Solids



Triangular Prism

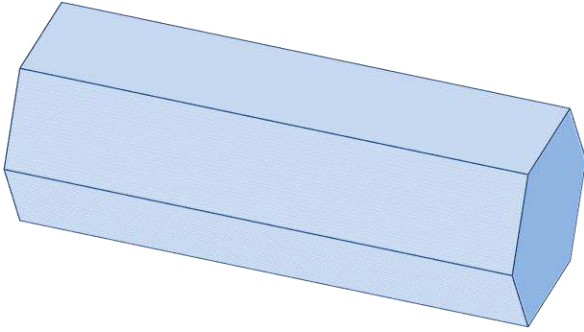


Cuboid

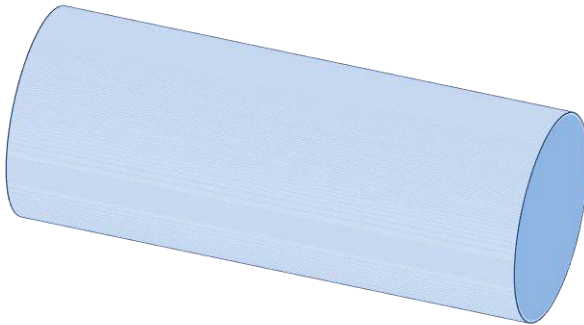


Cube

Solids



Hexagonal Prism



Cylinder

Metric Units of Measurement - Length

Metric Unit	Symbol	Relationships
Millimetre	mm	one millimetre is: 1/1000 of a metre 1/10 of a centimetre
Centimetre	cm	one centimetre is: 1/100 of a metre 10 millimetres
Metre	m	one metre is: 1/1000 of a kilometre 100 centimetres 1,000 millimetres
Kilometre	km	one kilometre is: 1,000 metres

Getting a feel for metric lengths

- 1 **millimetre** is a bit thicker than a bank card
- 1 **centimetre** is about the width of an adult finger
- 1 **metre** is a bit wider than a normal door
- 1 **kilometre** is about the distance covered in a 12 minute walk

Metric Units of Measurement - Weight

Metric Unit	Symbol	Relationships
Milligram	mg	one milligram is: 1/1000 of a gram
Gram	g	one gram is: 1/1000 of a kilogram 1,000 milligrams
Kilogram	kg	one kilogram is: 1,000 grams
Metric Tonne	t	one metric tonne is: 1,000 kilograms

Getting a feel for metric weights

- 1 **milligram** is about half the weight of a grain of salt.
- 1 **gram** is about one fifth of the weight of a piece of paper or about 5 times the weight of a raindrop.
- 1 **kilogram** is the weight of a normal sized bag of sugar or about twice the weight of a 500ml bottle of water.
- 1 **tonne** is about the weight of two small cars.

Metric Units of Measurement - Volume

Metric Unit	Symbol	Relationships
Millilitre	ml	one millilitre is: 1/1000 of a litre
Centilitre	cl	one centilitre is: 1/100 of a litre 10 millilitres
Litre	l	one litre is: 100 centilitres 1,000 millilitres

Getting a feel for metric volumes

- 1 **millilitre** is about one fifth the volume of a medicine spoon.
- 1 **centilitre** is about twice the volume of a medicine spoon.
- 1 **litre** is the volume of two normal sized bottles of water or half the volume of a big bottle of fizzy pop.

Measurement - Systems

In the 1970s the UK started switching from the old system of measurement (imperial) to the new system (metric).

Older people often 'think' in imperial, particularly if they are estimating measurements.

Some measurements are often still given in imperial units e.g. height is often measured in feet & inches; body weight is often measured in stones & pounds, beer is measured in pints and road signs show distances in miles.

Units of Measurement - Length Conversions

The conversions in the table below are approximate (\approx means almost equal to)

Metric Unit	Conversion to Imperial
Millimetre	1 inch \approx 25.4 millimetres
Centimetre	1 inch \approx 2.54 millimetres
Metre	1 foot \approx 0.30 metres
	1 yard \approx 0.91 metres
Kilometre	1 mile \approx 1.61 kilometres

Units of Measurement - Weight Conversions

The conversions in the table below are approximate (\approx means almost equal to)







Metric Unit	Conversion to Imperial
Milligram	1 ounce \approx 28349 milligrams
Gram	1 ounce \approx 28.35 grams
Kilogram	1 pound \approx 0.45 kilograms
	1 stone \approx 6.35 kilograms

Units of Measurement - Volume Conversions







The conversions in the table below are approximate (\approx means almost equal to)

Metric Unit	Conversion to Imperial
Millilitre	1 fluid ounce \approx 28.41 millilitres
Centilitre	1 pint \approx 56.82 centilitres
Litre	1 pint \approx 0.57 litres







Displaying and Writing Time

24 hour clock	am/pm	Analogue	Written
00:00	12.00 am		12 o'clock (midnight)
01:00	1.00 am		1 o'clock
02:00	2.00 am		2 o'clock
03:00	3.00 am		3 o'clock
04:00	4.00 am		4 o'clock
05:00	5.00 am		5 o'clock







Displaying and Writing Time

24 hour clock	am/pm	Analogue	Written
06:00	6.00 am		6 o'clock
07:00	7.00 am		7 o'clock
08:00	8.00 am		8 o'clock
09:00	9.00 am		9 o'clock
10:00	10.00 am		10 o'clock
11:00	11.00 am		11 o'clock



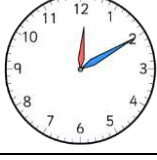
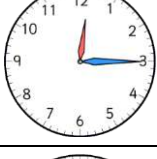
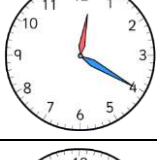
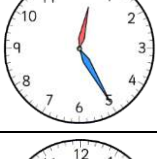

Displaying and Writing Time

24 hour clock	am/pm	Analogue	Written
12:00	12.00 pm		12 o'clock midday
13:00	1.00 pm		1 o'clock
14:00	2.00 pm		2 o'clock
15:00	3.00 pm		3 o'clock
16:00	4.00 pm		4 o'clock
17:00	5.00 pm		5 o'clock







Displaying and Writing Time

24 hour clock	am/pm	Analogue	Written
18:00	6.00 pm		6 o'clock
19:00	7.00 pm		7 o'clock
20:00	8.00 pm		8 o'clock
21:00	9.00 pm		9 o'clock
22:00	10.00 pm		10 o'clock
23:00	11.00 pm		11 o'clock

Displaying and Writing Time

24 hour clock	am/pm	Analogue	Written
00:00	12.00 am		12 o'clock
00:05	12.05 am		5 past 12
00:10	12.10 am		10 past 12
00:15	12.15 am		quarter past 12
00:20	12.20 am		20 past 12
00:25	12.25 am		25 past 12
00:30	12.30 am		half past 12

Displaying and Writing Time

24 hour clock	am/pm	Analogue	Written
00:35	12.35 am		25 to 1
00:40	12.40 am		20 to 1
00:45	12.45 am		quarter to 1
00:50	12.50 am		10 to 1
00:55	12.55 am		5 to 1
01:00	1.00 am		1 o'clock

Time Words

Word	Duration
Minute	60 seconds
Hour	60 minutes
Day	24 hours
Week	7 days
Fortnight	14 days
Month	Between 28 and 31 days
Quarter	3 months
Year	365 days 366 days in a leap year 52 weeks 12 months
Decade	10 years
Century	100 years
Millennium	1000 years