Year 4: Maths Knowledge

Counting from 0

Counting in **multiples of 6**
0, 6, 12, 18, 24, 30, 36, 42 …

Counting in **multiples of 7**
0, 7, 14, 21, 38, 35, 42, 49…

Counting in **multiples of 9**
0, 9, 18, 27, 36, 45, 54, 63 …

Counting in **multiples of 25**
0, 25, 50, 75, 100, 125, 150…

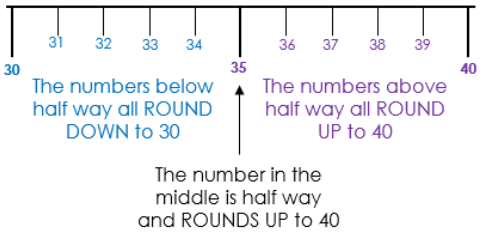
Counting in **multiples of 1000**
0, 1000, 2000, 3000, 4000…

Counting up and down in **hundredths**

$\frac{1}{100}, \frac{2}{100}, \frac{3}{100}, \frac{4}{100} \ldots\ldots \frac{99}{100}, 1$

A **thousand more** than 4753 is 5753.
A **thousand less** than 4753 is 3753.

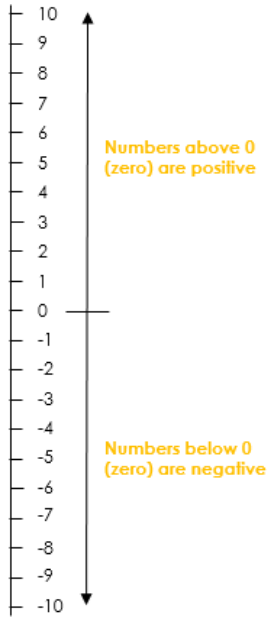
Rounding



Rounding to 100 and 1000 follows the same rule.
350 rounds up to 400
3500 rounds up to 4000

Rounding decimal places also follows the same rule.
3.4 rounds to 3.0 but 3.5 rounds to 4.0
3.04 rounds to 3.00 but 3.05 rounds to 3.10

Negative Numbers



Multiplication Tables
(and 2x,3x,4x,5x,8x,10x from previous years)

x	6	7	9	11	12
1	6	7	9	11	12
2	12	14	18	22	24
3	18	21	27	33	36
4	24	28	36	44	48
5	30	35	45	55	60
6	36	42	54	66	72
7	42	49	63	77	84
8	48	56	72	88	96
9	54	63	81	99	108
10	60	70	90	110	120
11	66	77	99	121	132
12	72	84	108	132	144

Formal methods of short multiplication and division

351 x 7
becomes

$$\begin{array}{r} 3\ 5\ 1 \\ \times\quad\ 7 \\ \hline 2\ 4\ 5\ 7 \\ \hline 2\ 3 \end{array}$$

91 ÷ 7
becomes

$$\begin{array}{r} 1\ 3 \\ 7\overline{)\ 9\ 1} \\ \quad\ 2 \end{array}$$

Roman Numerals

1 = I	10 = X
2 = II	20 = XX
3 = III	30 = XXX
4 = IV	40 = XL
5 = V	50 = L
6 = VI	60 = LX
7 = VII	70 = LXX
8 = VIII	80 = LXXX
9 = IX	90 = XC
	100 = C

Factors

A **factor pair** is a pair of numbers that, when multiplied will result in a given product.

Factor pairs of 16 are
1 , 16
2 , 8
4 , 4

Year 4: Maths Knowledge

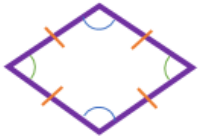
Time – Sticky Knowledge

Digital and analogue clocks

Both clocks show it is 10 o'clock. But only the digital clock shows that it is pm (in the evening) because it is using 24 hour time.

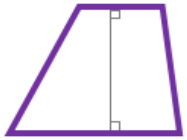
2D Shapes

Rhombus



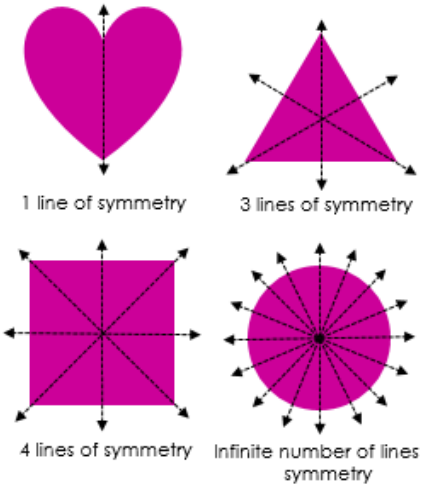
All four sides are the same length, like a square that has been squashed sideways.

Trapezium (or trapezoid)



Two sides are parallel. Side lengths and angles are not equal.

Symmetry



Simplifying fractions

$\frac{40}{80} = \frac{20}{40} = \frac{10}{20} = \frac{5}{10} = \frac{1}{2}$ So $\frac{40}{80} = 0.5$

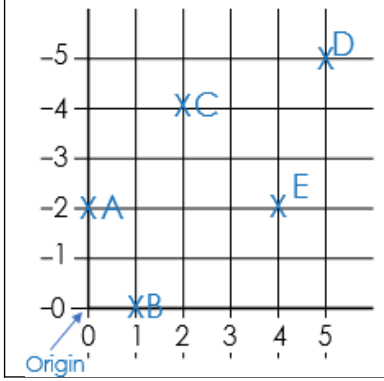
Area

The area of this shape → EQUALS → the area of these two

The area of this shape = (6 X 6) + (2 X 3)
= 36 + 6
= 42 cm²

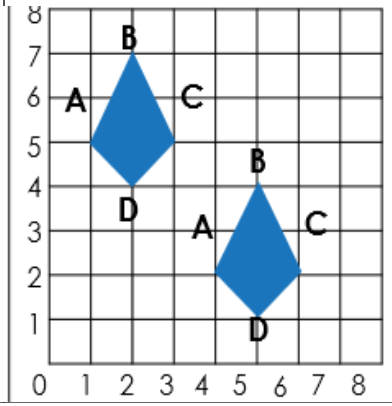
Place value Each row divides by 10	Tens	Ones		tenths	hundredths
45	4	5		0	0
$4.5 = 4\frac{5}{10} = 4\frac{1}{2}$	0	4		5	0
$0.45 = \frac{45}{100}$	0	0		4	5

Coordinates



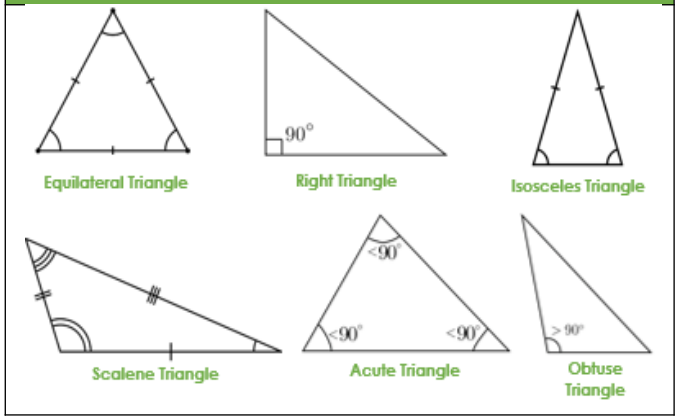
X axis comes first, so

A = (0,2)
B = (1,0)
C = (2,4)
D = (5,5)
E = (4,2)



This shape has been **translated** up and left by -3, -3. (Taken away from each co-ordinate.)

Triangles



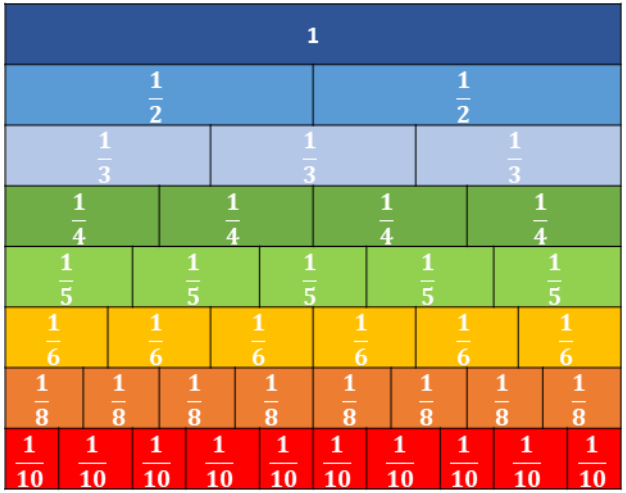
Year 3: Maths Knowledge

Counting from 0
Counting in **multiples of 4** 0, 4, 8, 12, 16, 20, 24, 28, 32…
Counting in **multiples of 8** 0, 8, 16, 24, 32, 40, 48…
Counting in **multiples of 50** 0, 50, 10, 150, 20, 250, 300…
Counting in **multiples of 100** 0, 100, 200, 300, 400, 500…

Vocabulary	
100	**hundred**
1000	**thousand**
+ - **X ÷**	**inverse operations**
$\frac{1}{2}$	**Numerator**
$\frac{1}{2}$	**Denominator**

Place value	Thousands	Hundreds	Tens	Ones
1000	1	0	0	0
589	0	5	8	9
305	0	3	0	5

Fractions



Equivalent Fractions

Examples:

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

$\frac{5}{10} = \frac{4}{8}$

Adding fractions

$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

Multiplication Tables			
x	**3**	**4**	**8**
1	3	4	8
2	6	8	16
3	9	12	24
4	12	16	32
5	15	20	40
6	18	24	48
7	21	28	56
8	24	32	64
9	27	36	72
10	30	40	80
11	33	44	88
12	36	48	96

Formal methods of addition, subtraction and short multiplication and division

768 + 653 becomes

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

862 - 514 becomes

	8	6	2
-	5	1	4
	3	4	8

934 - 456 becomes

	8	12	1
	~~9~~	~~3~~	4
-	4	5	6
	4	7	8

26 x 8 becomes

		2	6
x			8
2	0	8	
		4	

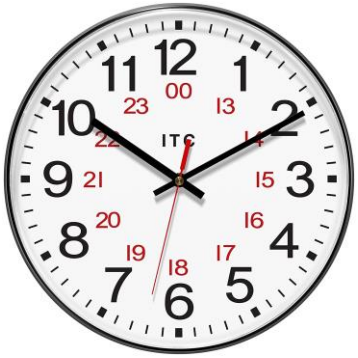
78 ÷ 6 becomes

		1	3
			1
6	7	8	

Year 3: Maths Knowledge

Time – Sticky Knowledge

24 hour clocks



The time is 10.10 in the morning or 22.10 in the evening in 24 hour time.

Roman numerals

This clock is showing X to II or 10 to 2.
On some clocks the 4 is IIII and sometimes it is IV

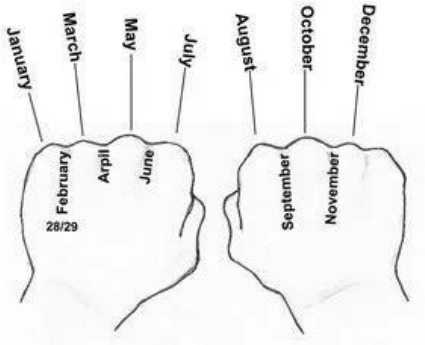
a.m. is from **midnight** until mid-day (noon)
1 to 12 in 24 hour clock time

p.m. is from mid-day (**noon**) until midnight
13 to 24 in 24 hour clock time

There are **365 days in a year.**
A leap year has 366 days. This is February 29th and happens every 4 years.

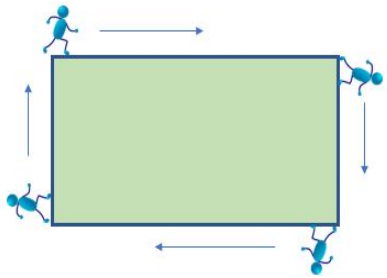
January	31 days
February	28 days
March	31 days
April	30 days
May	31 days
June	30 days
July	31 days
August	31 days
September	30 days
October	31 days
November	30 days
December	31 days

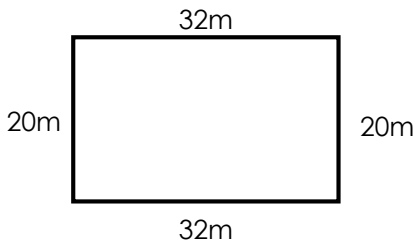
'Knuckle Mnemonic'



Perimeter

Perimeter is the distance around a 2D shape



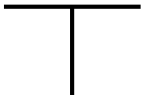


Non symmetrical (irregular) polygons

Polygon/Shape	Regular	Irregular
Triangle		
Quadrilateral		
Pentagon		
Hexagon		
Heptagon		
Octagon		

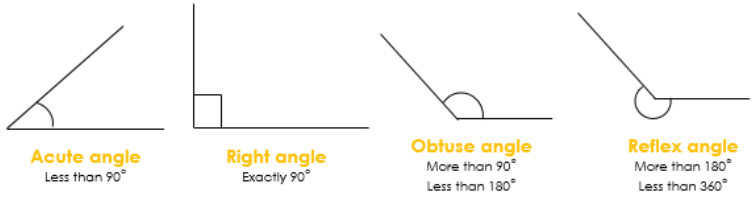
Lines

Parallel



Perpendicular

Angles



Year 2: Maths Knowledge

Read and write numbers to at least 100 in numerals and in words			
0	zero	10	ten
1	one	20	twenty
2	two	30	thirty
3	three	40	forty
4	four	50	fifty
5	five	60	sixty
6	six	70	seventy
7	seven	80	eighty
8	eight	90	ninety
9	nine	100	one hundred

Symbols and Vocabulary	
x	multiply, times
÷	divide
<	is less than
>	is greater than
=	is equal to

Counting to at least 100
Count forwards and backwards from **any number in steps of 2**
Count forwards and backwards from **any number in steps of 3**
Count forwards and backwards from **any number in steps of 5**
Count forwards and backwards from **any number in steps of 10**

Addition and multiplication can be done in any order. But subtraction and division can not!
23 + 11 = 34 11 + 23 = 34
3 x 5 = 15 5 x 3 = 15
23 – 11 = 12 But you can not take 23 coins from 11 coins
10 ÷ 5 = 2 5 ÷ 10 = ½

Using knowledge of number bonds within 20 (from Year 1) to calculate to at least 100
Examples: If 3 + 7 = 10 then 30 + 70 = 100 If 6 – 4 = 2 then 60 – 40 = 20

Multiplication Tables			
x	2	5	10
1	2	5	10
2	4	10	20
3	6	15	30
4	8	20	40
5	10	25	50
6	12	30	60
7	14	35	70
8	16	40	80
9	18	45	90
10	20	50	100
11	22	55	110
12	24	60	120

Fractions	
½	a half
¼	a quarter
¾	three quarters
½ = two quarters	
You can calculate fractions of numbers: ½ of 20 is 10. This is the same as dividing 20 by 2. ¼ of 20 is 5. This is the same as dividing 20 by 4.	

2 Digit Place value	Tens	Ones
Example 56 is	5	6
99	9	9
7	0	7

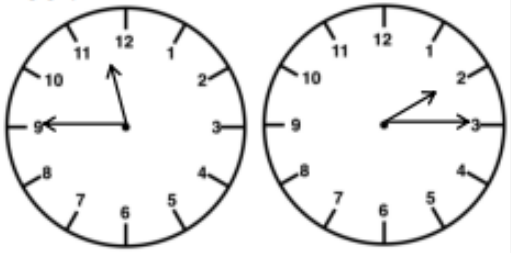
Year 2: Maths Knowledge

Time – Sticky Knowledge

There are **24 hours in a day**

There are **60 minutes in an hour and a clock shows these in 5 minute intervals**

Quarter to is when the minute hand points to the 9 and the hour hand nearly points at the hour.
Quarter past is when the minute hand points to the three and the hour hand points past just the hour.



Quarter to 12 Quarter past 2

Coins

Pounds £

Pence p

Key Vocabulary - Measurement

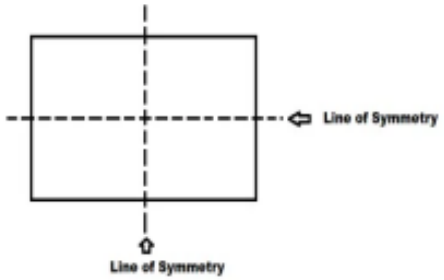
Metre m
Centimetre cm

Kilogram kg
Gram g

Litre l
Millilitre ml

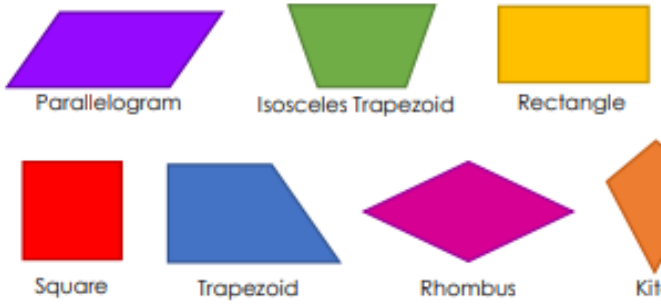
Degrees centigrade °c

Symmetry



2D Shapes

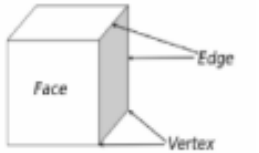
Quadrilaterals have four sides



A polygon is a 2D shape with straight sides

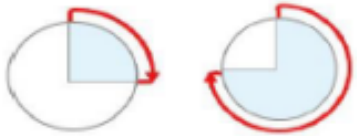
3D Shapes

Faces, edges and vertices



Direction

Quarter turn is 1 right angle
¾ turn is 3 right angles



Year 1: Maths Knowledge

Numerals and Number Vocabulary			
0	zero	10	ten
1	one	20	twenty
2	two	30	thirty
3	three	40	forty
4	four	50	fifty
5	five	60	sixty
6	six	70	seventy
7	seven	80	eighty
8	eight	90	ninety
9	nine	100	one hundred

Symbols and Vocabulary	
+	**plus, add**
-	**minus, subtract**
=	**is equal to**

Odd and Even
Odd numbers end in 1, 3, 5, 7, 9
Even numbers end in 2, 4, 6, 8, 0

Counting
Count forwards and backwards from **any number to and across 100**
Count in **2s 2, 4, 6, 8, 10, 12…**
Count in **5s 5, 10,15, 20, 25, 30…**
Count in **10s 10, 20, 30, 40, 50 …**
Say the number **one more than…**
Say the number **one less than…**

Doubles, halves and quarters		
Number	double	quarter
6	12	
7	14	
8	16	2
9	18	
10	20	
Number	half	quarter
12	6	3
14	7	
16	8	4
18	9	
20	10	5

Number bonds within 20	
1	1+0
2	2+0 1+1
3	3+0 2+1
4	4+0 3+1 2+2
5	5+0 4+1 3+2
6	6+0 5+1 4+2 3+3
7	7+0 6+1 5+2 4+3
8	8+0 7+1 6+2 5+3 4+4
9	9+0 8+1 7+2 6+3 5+4
10	10+0 9+1 8+2 7+3 6+4 5+5
11	11+0 10+1 9+2 8+3 7+4 6+5
12	12+0 11+1 10+2 9+3 8+4 7+5 6+6
13	13+0 12+1 11+2 10+3 9+4 8+5 7+6
14	14+0 13+1 12+2 11+3 10+4 9+5 8+6 7+7
15	15+0 14+1 13+2 12+3 11+4 10+5 9+6 8+7
16	16+0 15+1 14+2 13+3 12+4 11+5 10+6 9+7 8+8
17	17+0 16+1 15+2 14+3 13+4 12+5 11+6 10+7 9+8 8
18	18+0 17+1 16+2 15+3 14+4 13+5 12+6 11+7 10+8
19	19+0 18+1 17+2 16+3 15+4 14+5 13+6 12+7 11+8 10+9
20	20+0 19+1 18+2 17+3 16+4 15+5 14+6 13+7 12+8 11+9 10+10

Year 1: Maths Knowledge

Time – Sticky Knowledge

There are **24 hours in a day**

There are **60 minutes in an hour**

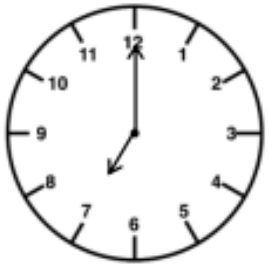
There are **60 seconds in a minute**

A.M. means in the morning

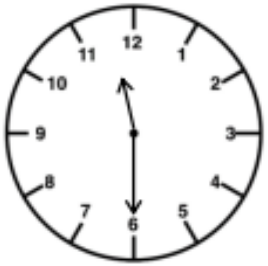
P.M. means in the afternoon

O'Clock is when the minute hand points to the 12 and the hour hand points at the hour.

Half past is when the minute hand points to the six and the hour hand points past the hour.



Seven o'clock



Half past eleven

Days of the Week

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

Months of the Year

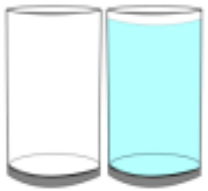
January
February
March
April
May
June
July
August
September
October
November
December

Key Vocabulary - Measurement

long / short
longer / shorter
tall / short
double / half

heavy / light
heavier than…
lighter than…

full / empty
more than…
less than…
half full / half empty



quicker / slower
before / after
first / next
today / yesterday
morning / afternoon / evening

2D Shapes

square

rectangle

circle

triangle

3D Shapes

cube

cuboid

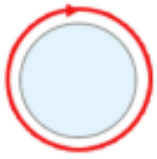
sphere

cone

cylinder

pyramid

Direction and Movement

Whole turn	Half turn	Quarter turn	Three- quarter turn
			

Reception: Maths Knowledge

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

Number bonds to 5

1	2	3	4	5
0 + 1	0 + 2	0 + 3	0 + 4	0 + 5
	1 + 1	1 + 2	1 + 3	1 + 4
			2 + 2	2 + 3

Quantity To 10

1		6	
2		7	
3		8	
4		9	
5		10	

Weight

Heavy / Heavier / Heaviest	
Light / Lighter / Lightest	
Balanced / Equal	

Time

O'clock
The hour hand points to the time and the minute hand points to 12.

Days of the Week

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

Shapes

circle	
triangle	
square	
rectangle	

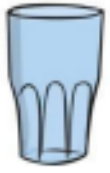
Months Of The Year

January	February	March
April	May	June
July	August	September
October	November	December

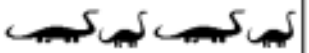
Number	Double
0	0
1	2
2	4
3	6
4	8
5	10

Number	Half
0	0
2	1
4	2
6	3
8	4
10	5

Capacity

Empty	Half Full	Full
		

Pattern

Colour		blue, red, blue, red
Size		big, small, big, small
Length		long, short, long, short