Year 7 Autumn 1

Significant Figures

just to look nice → **0.0560** ← not significant (any zero at start)

1st significant digit
2nd significant digit
3rd significant digit

Rounding 10 / 100 / 1000

Circle the number you are rounding
Look to the number on the right.

5 or above: round up
4 or below: stay the same

Estimating

Round to 1 significant figures

$562 \rightarrow 600$
$233 \rightarrow 200$
$600 \times 200 = 120,000$

Expression, Equation or Formula?

Expressions: Algebra with no equals sign, eg: 2x+3y
Equations: Two expressions that are equal, eg: 3x+4=2x-5
Formula: A Rule or fact with mathematical symbols, eg: v = u + at

Simplifying Algebra

$x + 4y + 6x + 2y \equiv 7x + 6y$

$3x + y - 2x + 4y \equiv x + 5y$

Rounding

To round 7.63 to 1 decimal place

7.63

↑ 3 is less than 5 (half way) so round down

7.63 rounded to 1 decimal place is 7.6

Multiplying Decimals

3.4 x 2.5
x10   x10
34 x 25
Calculate the answer
34 x 25 = 850
Now divide the answer
$850 \div 10 \div 10 = 8.5$

Error Bounds

6.1 rounded to 1dp
6.0 ↓ 6.1 ↓ 6.2
   6.05   6.15

Place Value

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Decimal point	Tenths	Hundredths	Thousandths	Ten-thousandths	Hundred-thousandths	Millionths
							.						

Multiplying by 10, 100, 1000

When you multiply by 10 all number move one place to the left.
When you multiply by 100 all number move two places to the left.

Dividing by 10, 100, 1000

When you divide by 10 all number move one place to the right.
When you divide by 100 all number move two places to the right.

Standard Form

Positive Power = Large Number
$4.3 \times 10^6 = 4\ 300\ 000$
Negative Power = Small Number
$2.1 \times 10^{-3} = 0.021$

$(4 \times 10^6) \times (2 \times 10^3)$
$= 8 \times 10^9$

Negative Numbers

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$+ \times - \atop - \times +$ } $-$

$+ \times + \atop - \times -$ } $+$

$+ \div - \atop - \div +$ } $-$

$+ \div + \atop - \div -$ } $+$

$+ - \atop - +$ } $-$

$+ + \atop - -$ } $+$

Ordering Decimals

Add zeros so that all the numbers have the same number of decimal places. Order the numbers

1.4	1.**400**	1.045
1.75	1.75**0**	1.231
1.045	1.045	1.4
1.56	1.56**0**	1.56
1.231	1.231	1.75

Multiplication

```
    1  3  4          96
          5  X       32  X
    ----------      ------
    6  7  0          192  ⟵ this is 96 x 2
    1  2            2880  ⟵ this is 96 x 30
                   ------
                    3072  ⟵ this is 96 x 32
```

Year 7 Autumn 2

Perimeter

The distance around a 2D shape
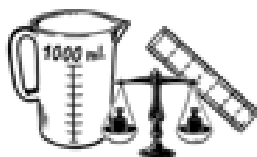

6m + 2m + 4m + 4m + 2m + 6m = 24m
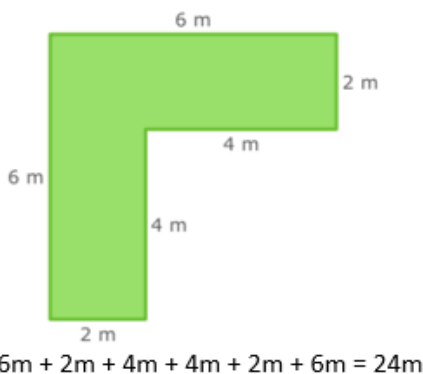
Metric Units

Length: mm, cm, m, km

Mass: mg, g, kg

Volume: ml, cl, l

Metric Conversions

mm $\xrightarrow{\div 10}$ cm $\xrightarrow{\div 100}$ m $\xrightarrow{\div 1000}$ km

mm $\xleftarrow{\times 10}$ cm $\xleftarrow{\times 100}$ m $\xleftarrow{\times 1000}$ km

g $\xrightarrow{\div 1000}$ kg $\xrightarrow{\div 1000}$ tonnes

g $\xleftarrow{\times 1000}$ kg $\xleftarrow{\times 1000}$ tonnes

ml $\xrightarrow{\div 1000}$ litres

ml $\xleftarrow{\times 1000}$ litres
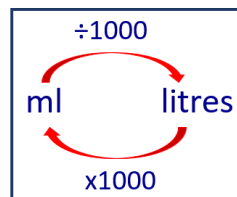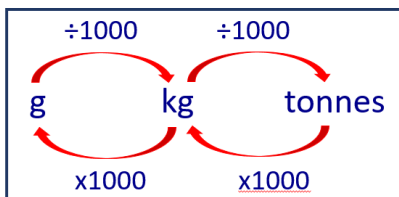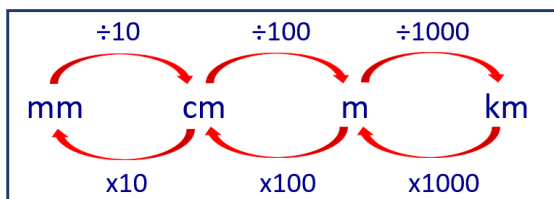
Dividing Decimals

3.6 ÷ 0.4

Multiply the divisor to make it a whole number; multiply the other number by the same amount.

3.6 ÷ 0.4

x10   x10

36 ÷ 4 = 9

Averages

Mode - The most common value

Median - The central number when the data is ordered

Mean - Add all the values up and divide by the number of values

Range - Difference between highest and lowest value

Reverse Mean

The mean of 4 numbers is 15, if 3 of the numbers are 11, 17, and 12, what is the forth number?

First we need the total of the four numbers

$$\text{mean} = \frac{\text{total of the data}}{\text{number of pieces data}}$$

$$15 = \frac{\text{total of the data}}{4}$$

total of the data = 15 x 4 = 60

11 + 17 + 12 + ? = 60   ? = 20

Mean of Tabled data

No of portions	Girls	
0	X 6	0
1	X 7	7
2	X 7	14
3	X 12	36
4	X 17	68
5	X 16	80
6	X 15	90
7	X 12	84
	92	379

Mean is the total portions divided by the total girls.

Mean: $\frac{379}{92} = 4.1$ portions

Division

$3\overline{)72}$

$3\overline{)7^12}$

$3\overline{)7^12}$ 24

so 72 ÷ 3 = 24

7 ÷ 3 = 2 remainder 1

12 ÷ 3 = 4

$12\overline{)744}$ 0

$12\overline{)7^74^24}$ 06

$12\overline{)7^74^24}$ 062

7 ÷ 12 = 0 carry 7

74 ÷ 12 = 6 carry 2

24 ÷ 12 = 2

113 ÷ 2

$2\overline{)1^11^13.^10}$ 056.5

Factors, Multiples and Primes

Multiples are numbers in a given times table:

Multiples of 4:
4, 8, 12, 16, 20, 24, ...

Factors are numbers that divide into a given number with no remainders.
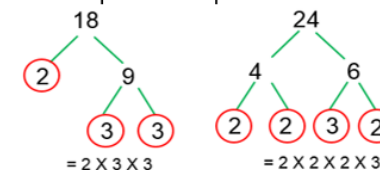
Factors of 12: 1, 2, 3, 4, 6, 12
1 x 12
2 x 6
3 x 4

Prime numbers have two factors: one and itself

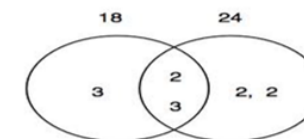eg: 7 = 1 x 7 so is prime
6 = 1 x 6 and 2 x 3
so is not prime
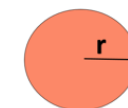
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HCF and LCM

To find the LCM and HCF of 18 and 24 using a Venn diagram:

Find the product of primes for 18 and 24.

= 2 X 3 X 3   = 2 X 2 X 2 X 3

Place the numbers in the Venn diagram. Any numbers in both go into the centre.

HCF - multiply all the numbers in the centre.   HCF = 2 x 3 = 6
LCM - multiply all the numbers in the Venn diagram.
LCM = 3 x 2 x 3 x 2 x 2 = 72

Circumference of a Circle

$C = 2\pi r$