Y9 Maths Knowledge Organiser Topic 3: Solving Linear Equations

What must I be able to do?		Key vocabulary	
What must I be able to do? You may need to revise the following: • Year 8 Topic 4: Algebra 2 • Year 7 Topic 6: Algebra 1 Recap content: • Solve linear equations where the unknown appears on only one side • Solve equations where the unknown appears in the numerator of a fraction • Solve equations which involve brackets • Solve equations where the unknown appears on both sides • All skills found on Mathswatch 135a (GCSE)	Linear equation	An equation where the <u>highest power is</u> <u>only 1</u> , e.g. does not contain an x ² or higher power.	

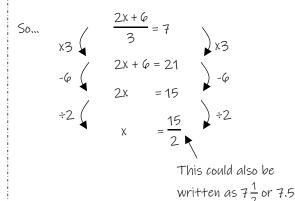
Solving equations which require more steps

e.g.

 $\frac{2x+6}{3} = 7$

The unknown (x) is on one side of the equals sign only. There is a fraction, a constant term and a coefficient all on the left hand side which need to be dealt with.

- Step 1: Remove the fraction by multiplying all terms by the denominator
- Step 2: Do the inverse of the constant
- Step 3: Do the inverse of the coefficient

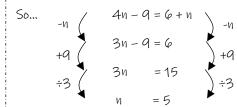


e.g.

$$4n - 9 = 6 + n$$

The unknown (n) is on both sides of the equals sign. There is also a constant term on both sides and a coefficient of 4 on the left hand side.

- Step 1: Do the inverse of the smallest amount of n
- Step 2: Do the inverse of the constant
- Step 3: Do the inverse of the coefficient



e.g. 3(2 - w) = 5(1 - w)

The unknown (w) is on both sides of the equals sign. There are brackets on both sides, coefficients on both sides and both w are negative.

- Step 1: Multiply out the brackets
- Step 2: Do the inverse of the smallest amount of w
- Step 3: Do the inverse of the constant
- Step 4: Do the inverse of the coefficient

So...
$$expand$$

 $+5w$ $(6 - 3w = 5 - 5w)$ $+5w$ $(6 + 2w = 5)$
 -6 $2w = -1$
 $\div 2$ $w = -\frac{1}{2}$ $\div 2$

-5w is smaller than -3w so we do the inverse of -5w not the inverse of -3w

$$3x - 8 = \frac{5x}{2} + 4$$

e.g.

The unknown (x) is on both sides of the equals sign. There is also a constant term on each side and a fraction to undo.

- Step 1: Remove the fraction by multiplying all terms by the denominator.
- Step 2: Do the inverse of the smallest amount of x
- Step 3: Do the inverse of the constant

