Algebra

- Tidying Up Terms
- Multiplying Terms
- Removing Brackets & Simplifying
- Solving Simple Equations (x+1=5)
- Harder Equations (2x+1=9)
- Solving Equations (brackets)
- Solving Equations (terms either side)
- Inequalities

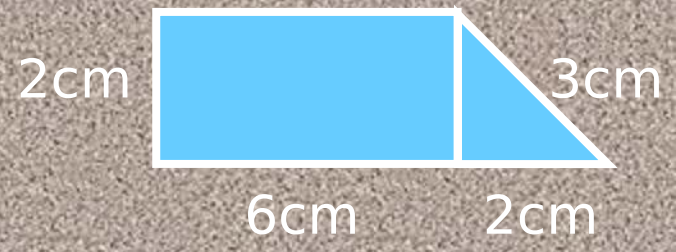
Starter Questions

1. A TV has been reduced in the sale by 20%. It was £250. How much is it now.

2. 30% of £300

3. Tidy up the expression

   5y + 3d +4d + 10y



4. Explain how do find the area and perimeter of the shape.

Algebra

Multiplying Terms

Learning Intention

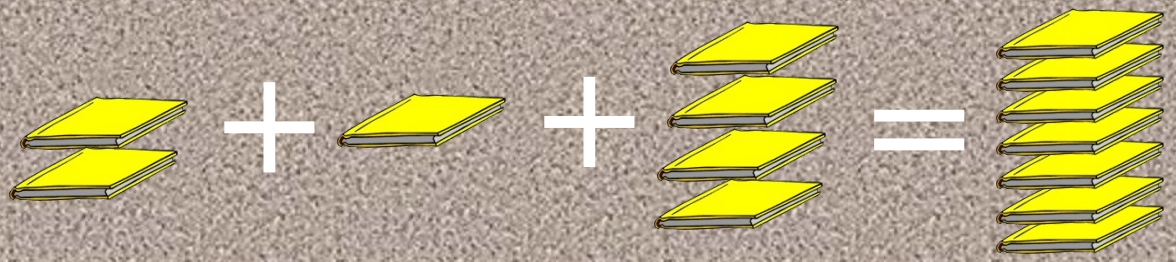
1. To explain how to gather ‘algebraic like terms’.

Success Criteria

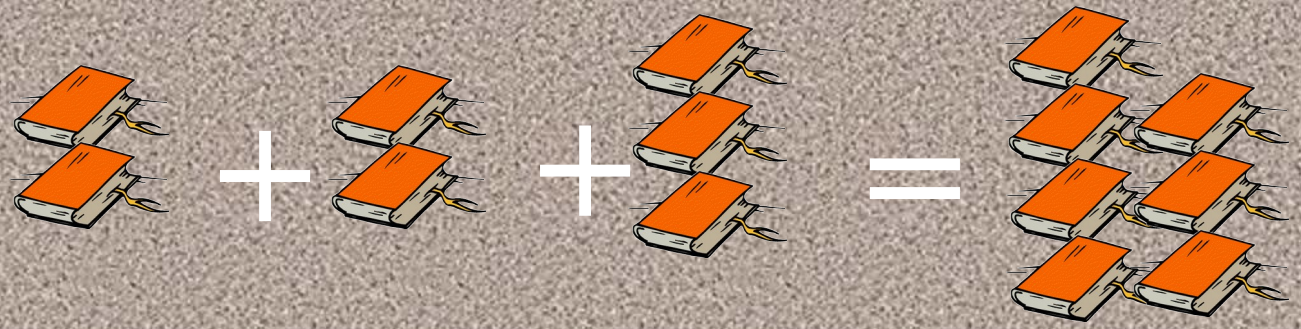
1. Understand the term ‘like terms’.

2. Gather like terms for simple expressions.

Tidying Terms

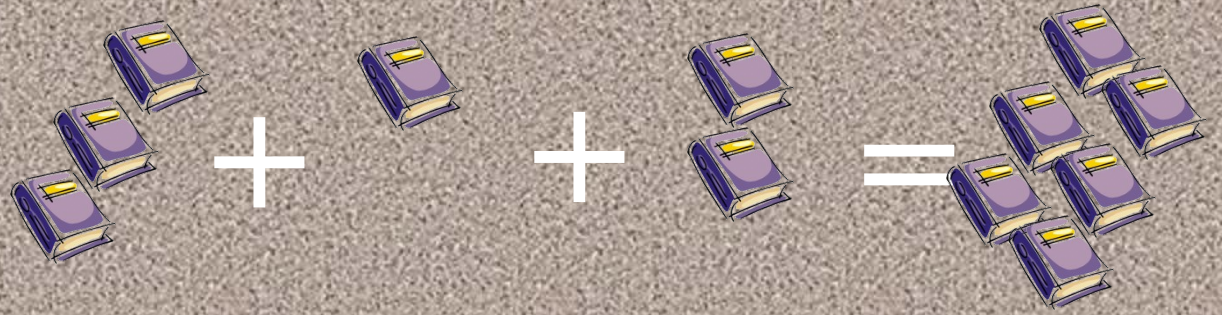
First Row : 

$2c + c + 4c = 7c$

2nd Row : 

$2d + 2d + 3d = 7d$

Tidying Terms

3rd Row : 

$3f + f + 2f = 6f$

In Total we have

CANNOT TIDY UP ANYMORE

$7c + 7d + 6f$

WE CAN ONLY TIDY UP “LIKE TERMS”

Tidying Terms

WE CAN ONLY TIDY UP "LIKE TERMS"

Tidy up the following:

Q1. $2x + 4x + 5y - 3y + 18$ $= 6x + 2y + 18$

Q2. $4a + 3b + 5a + 6 - b$ $= 9a + 2b + 6$

Algebra

Multiplying Terms

Learning Intention

1. To explain how to multiply out algebraic terms.

Success Criteria

1. Understand the key steps of multiplying terms.

2. Apply multiplication rules for simple expressions.

Algebra

Simplifying Algebraic Expressions

Reminder !

We can only add and subtract " like terms "

$x + x + x + x = 4x$

$9p - 7p = 2p$

$3a + b - a + 6b = 2a + 7b$

$10 + 6w - 1 = 9 + 6w$

$x^2 + x^2 + x^2 = 3x^2$

Algebra

Simplifying Algebraic Expressions

Reminder !

Multiplying terms

$7 \times a = 7a$

$w \times 5 = 5w$

$b \times b = b^2$ (NOT 2b)

$2m \times 4m = 8m^2$ (NOT 8m)

Algebra

Removing brackets

Learning Intention

1. To explain how to multiply out simply algebraic brackets.

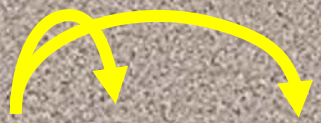
Success Criteria

1. Understand the key steps in removing brackets.

2. Apply multiplication rules for integers numbers when removing brackets.

Removing a Single Bracket

Example 1



$3(b + 5) = 3b + 15$

Example 2



$4(w - 2) = 4w - 8$

Removing a Single Bracket

Example 3



$2(y - 1) = 2y - 2$

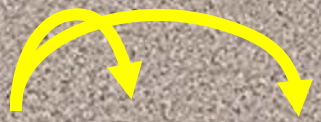
Example 4



$7(w - 6) = 7w - 42$

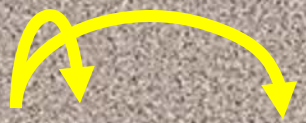
Removing a Single Bracket

Example 5



$8(x + 3) = 8x + 24$

Example 6



$4(3 - 2m) = 12 - 8m$

Removing a Single Bracket

Example 7



$7 + 3(4 - y) = 7 + 12 - 3y$

$= 19 -$

Tidy Up

Example 8



$9 - 3(8 - y) = 9 - 24 + 3y$

$= -15 + 3y$

Tidy Up

Removing Two Single Brackets

Example 9

$4(m - 3) - (m + 2) = 4m - 12 - m - 2$

$= 3m - 14$

Tidy Up

Example 10

$7(y - 1) - 2(y + 4) = 7y - 7 - 2y - 8$

$= 5y - 15$

Tidy Up

Equations

Solving Equations

Learning Intention

1. To solve simple equations using the 'Balancing Method'.

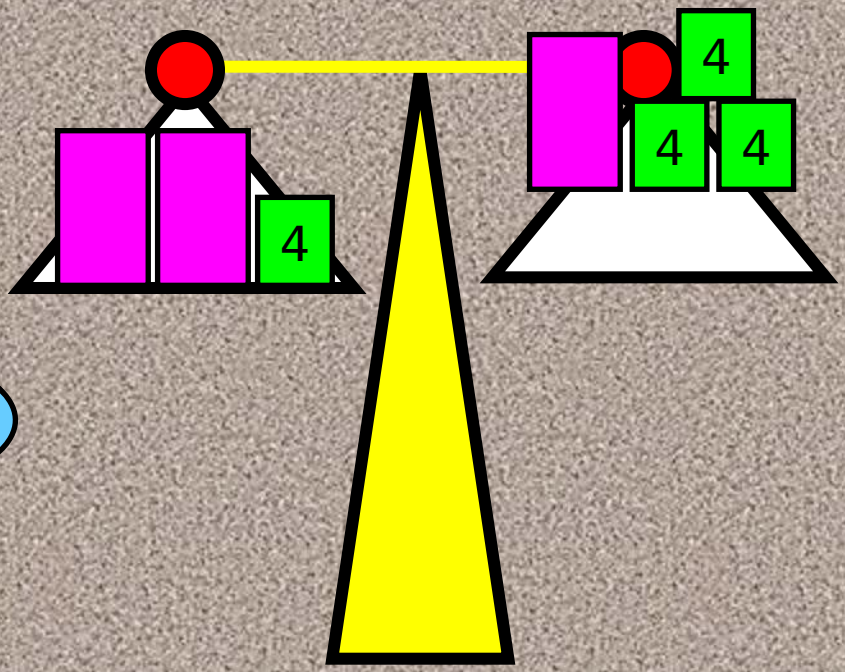
Success Criteria

1. Know the process of the 'Balancing Method'.
2. Solving simple algebraic equations.

Balancing Method

Kirsty goes to the shops every week to buy some potatoes.
She always buys the same total weight.
One week she buys 2 large bags and 1 small bag.
The following week she buys 1 large bag and 3 small bags.

If a small bags weighs 4 kgs. How much does a large bag weigh?

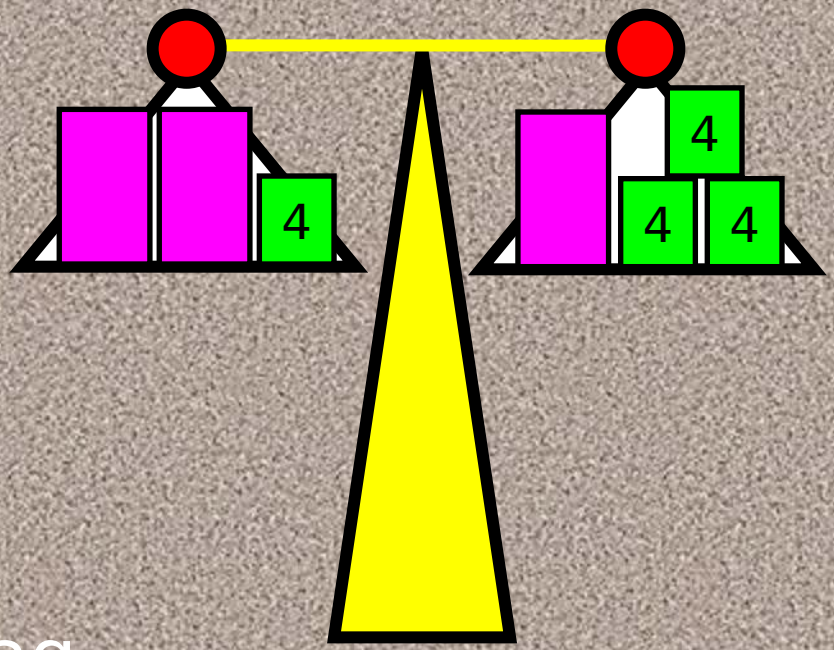


How can we go about solving this using balance ?

Balancing Method

Take a small bag away from each side.

Take a big bag away from each side.

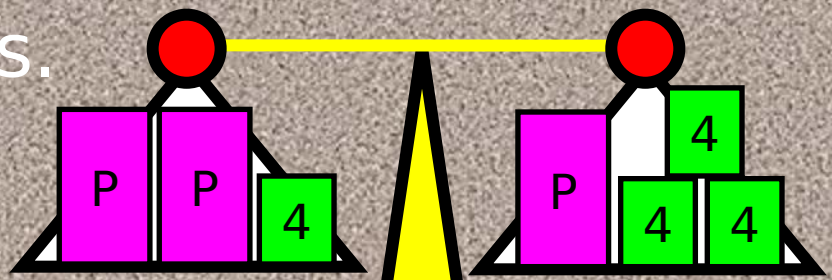


We can see that a big bag is equal to

4 + 4 =8 kg

Balancing M

What symbol should we use for the scales ?



Let’s solve it using maths.

Let P be the weight of a big bag.

We know that a small bag = 4

$$2P + 4 = P + 12$$
$$-4 \qquad -4$$

Subtract 4 from each side

$$2P = P + 8$$
$$-P \quad -P$$

Subtract P from each side

$$P = 8$$

Balancing Method

It would be far too time consuming to draw out
the balancing scales each time.

We will now learn how to use the rules for solving equations.

Equations

Solving Equations

The method we use to solve equations is

The Balancing Method

Write down the opposite of the following :

$+$ opposite is $-$ $-$ opposite is $+$

$\times$ opposite is $\div$ $\div$ opposite is $\times$

Simple Equations

Example 1

$x + 3 = 20$

(- 3)

$x = 20 - 3$

$x = 17$

Simple Equations

Example 2

$24 - x = 8$

(+ x) $24 = 8 + x$

(- 8) $24 - 8 = x$

$16 = x$

$x = 16$

Simple Equations

Example 3

$4x = 20$

$(\div 4)$

$x = 20 \div 4$

$x = 5$

Simple Equations

Example 4

$8x = 28$

$(\div 8)$

$x = 20 \div 8$

$x = 3.5$

Equations

Harder Equations

Learning Intention

1. To solve harder equations using the rule ‘Balancing Method’. repeatedly.

Success Criteria

1. Know the process of ‘Balancing Method’.
2. Solving harder algebraic equations by using rule repeatedly.

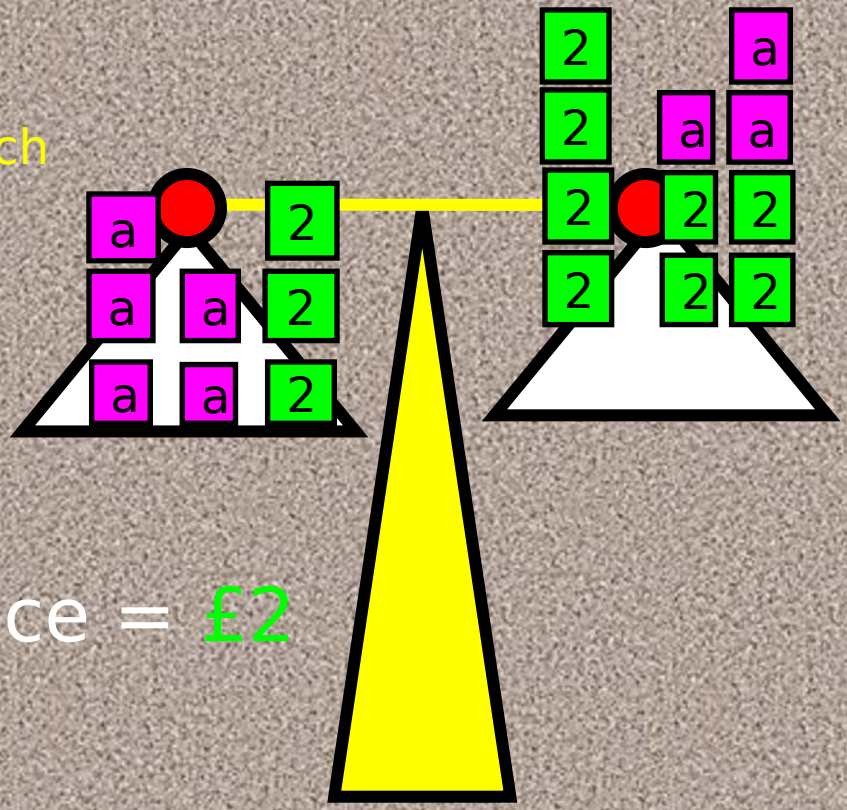
Balancing Method

Group of 5 adults and 3 children go to the local swimming.
Another group of 3 adults and 8 children also go swimming
The total cost for each group is the same.
A child's ticket costs £2.

If a child's ticket costs £2. How much for an adult ticket ?

Let a be the price of an adult ticket.

We know that a child price = £2



Balancing Method

For balance we

Subtract 3a from each side

$5a + 6 = 3a + 16$

$-6 \qquad -6$

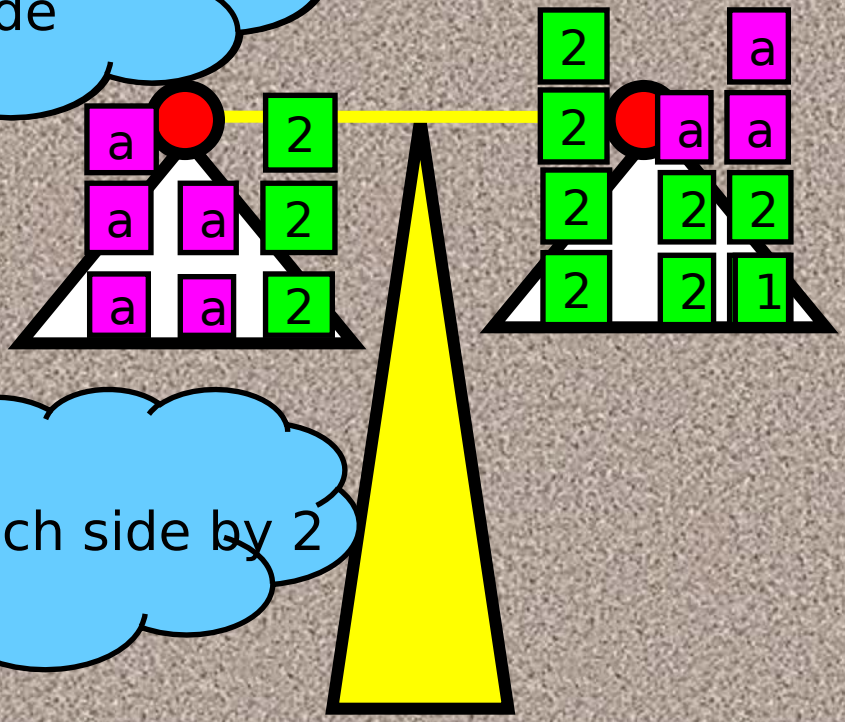
$5a = 3a + 10$

$-3a \quad -3a$

$2a = 10$

Divide each side by 2

$a = 5$



Adult ticket price is £5

Balancing Method

It would be far too time consuming to draw out
the balancing scales each time.

We will now learn how to use the rules for solving equations.

Equations

Level E Harder Equations

The rule we use to solve equations is

The Balancing Method

Write down the opposite of the following :

$+$ opposite is $-$ $-$ opposite is $+$

$\times$ opposite is $\div$ $\div$ opposite is $\times$

Equations

Example 1

$2x + 4 = 22$

(- 4) $2x = 18$

(÷2) $x = 9$

Equations

Example 2

$9x - 5 = 40$

$(+ 5)$ $9x = 45$

$(\div 9)$ $x = 5$

Starter Questions

Q1. Solve for x

(a) $x + 3 = 8$ (b) $2x - 14 = 50$

Q2. Is this statement true

$(x - 1) - 3(x + 1) = -2x$

Equations and brackets

Learning Intention

1. To show how to solve equations that have bracket terms.

Success Criteria

1. Be able to multiply out brackets and solve equations.

Equations and brackets

Multiply out the bracket first and then solve.

Example 1



$5(x - 3) = 25$

$5x - 15 = 25$

(+15) $5x = 25 + 15 = 40$

(÷5) $x = 40 \div 5 = 8$

Equations and brackets

Multiply out the bracket first
and then solve.

Example 2



$3(g - 1) = 9$

$3g - 3 = 9$

(+3) $3g = 9 + 3 = 12$

(÷3) $g = 12 \div 3 = 4$

Starter Questions

Q1. Solve for x

(a) $x + 7 = 29$ (b) $2x - 5 = 21$

Q2. Is this statement true

$(x + 1) - 2(x + 1) = -x$

Equations and brackets

Learning Intention

1. To show how to solve equations with terms on both sides.

Success Criteria

1. Be able to solve equations with terms on both sides.

Equations and brackets

Example 1

$6x - 3 = x + 7$

(- x) $5x - 3 = 7$

(+3) $5x = 7 + 3 = 10$

(÷5) $x = 10 \div 5$

$x = 2$

Equations and brackets

Example 2

$$8y + 1 = 5y + 7$$

(- 5y) $3y + 1 = 7$

(-1) $3y = 6$

(÷2) $y = 2$