

Learning intention:

I can make an equation to solve a work problem

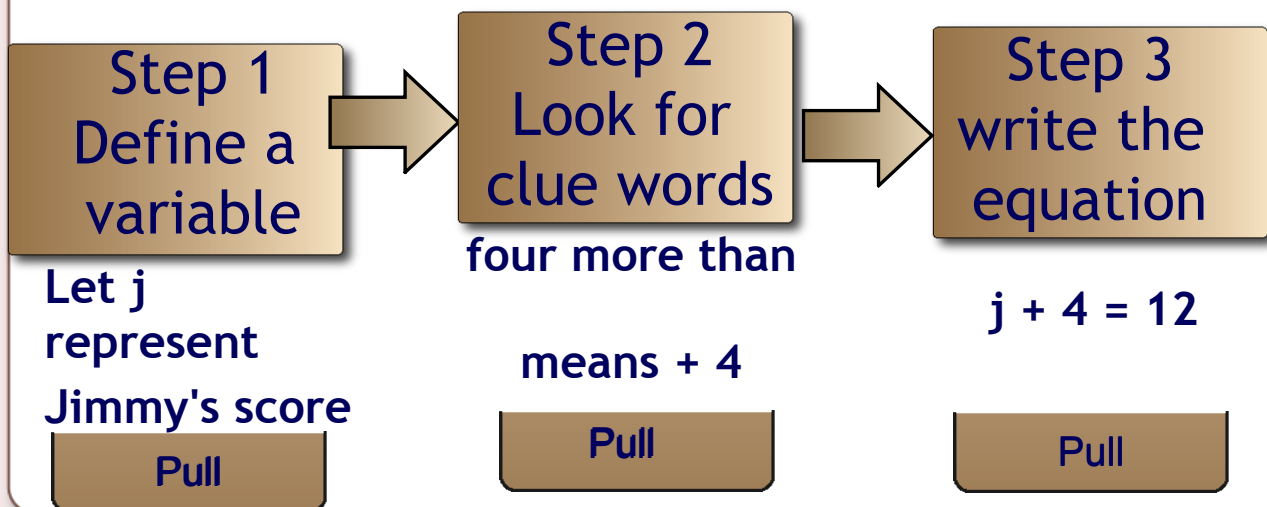
Sort the clue words for each operation.  
Click  for the answers.

Addition	Subtraction	Multiplication	Division
plus	less	times	
sum	minus	product	divided by
	difference		quotient
in all			equal groups



## Writing an algebraic equation

Juanita's score of 12 was four more than Jimmy's score. Write an equation that could be used to find Jimmy's score.



**Example 1**

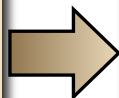
Use the model to write an equation for the problem.

The winning time of 23 seconds was three seconds shorter than Maria's. What was Maria's time?

**Step 1**  
Define a variable

the variable is Maria's time

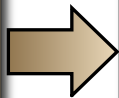
**hint**



**Step 2**  
Look for clue words

'shorter' means subtract

**hint**



**Step 3**  
write the equation

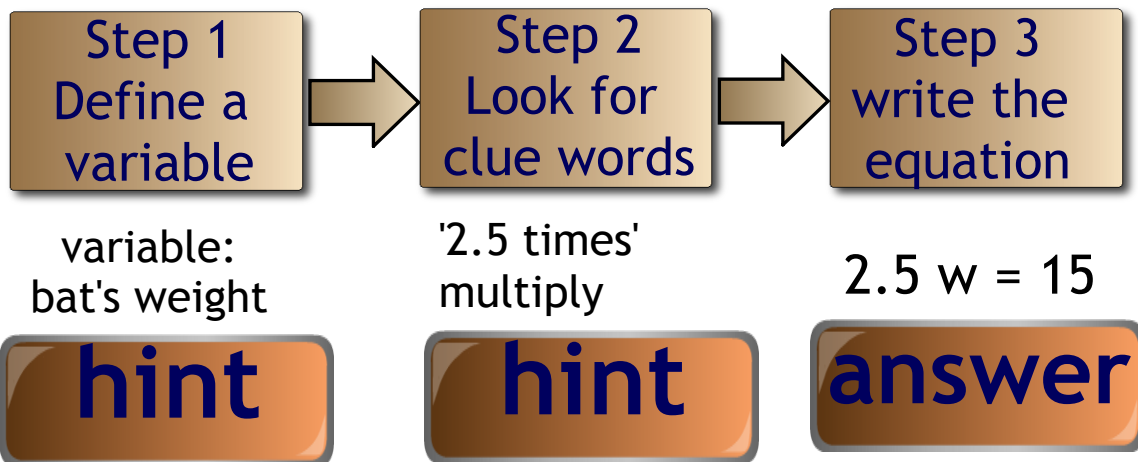
$$m - 3 = 23$$

**answer**

### Example 2

Use the model to write an equation for the problem.

The number of pounds of insects a bat can eat is 2.5 times its body weight. If a bat can eat 15 pounds of insects, how much does it weigh?





Match the equations with the problems.

Equation

Problem

The total was \$39 after a \$5 tip was added. What was the original bill?

A submarine dived 70 feet below its original depth. If the submarine's new depth is -550 feet, what was its original depth?

A drop of 4°F per hour for several hours resulted in a total temperature change of -18 degrees. How many hours passed?

$$b + 5 = 39$$

$$d - 70 = -550$$

$$d - 70 = 550$$

$$n - 4 = 18$$

$$5b = 39$$

$$-4n = -18$$





Match the equations with the problems.  
ANSWERS

**Equation**

**Problem**

A drop of 4°F per hour for several hours resulted in a total temperature change of -18 degrees.

The total was \$39 after a \$5 tip was added. What was the original bill?

A submarine dived 70 feet below its original depth. If the submarine's new depth is -550 feet, what was it's original depth?

$d - 70 = -550$

$b + 5 = 39$

$-4n = -18$

$n - 4 = 18$

$5b = 39$

$d - 70 = 550$

On an algebra test, the highest grade was 42 points higher than the lowest grade. The sum of the two grades was 138. Find the lowest grade.

Let 'X' = the lowest grade  $48 + 90 = 138$

$x + 42$  = the highest grade

Make an equation...

$$x + x + 42 = 138$$

Answer

$$2x + 42 = 138$$

$$2x + 42 - 42 = 138 - 42$$

$$2x = 96$$

$$\frac{2x}{2} = 96 \div 2$$

$$x = 48$$

let the 1st be  $x^{41}$

$$x + x + 1 = 41$$

$$2x + 1 = 41$$

$$2x = 40$$

$$x = 20$$



James has 32 apples for lunch. Bill would need twice the number of apples he has plus 10 to have the same number of apples as James. How many apples does Bill have?

Over night a girl grew twice the height of her brother plus 5 cm. Her new height 80 cm. How tall is her brother?

**In a given amount of time, Jamie drove twice as far as Rhonda. Altogether they drove 90 miles. Find the number of miles driven by each.**

Mr Hong is twice as old as Mr. Fisher. The sum of their ages is 75. How old are they?

Rebecca and Jeb collected 156 pieces of candy on Halloween. Rebecca collected 6 less than 3 times as many pieces as Jeb. How many did each person collect?

The sum of two numbers is 84, and one of them is 12 more than the other. What are the two numbers?

Rebecca and Jeb collected 156 pieces of candy on Halloween. Rebecca collected 6 less than 3 times as many pieces as Jeb. How many did each person collect?

The sum of two consecutive numbers is 37. What are they?

The sum of two numbers is 84, and one of them is 12 more than the other. What are the two numbers?

let the first # be =  $x$

$$= x + 12$$

$$x + x + 12 = 84$$

$$2x + 12 = 84$$

$$2x + 12 - 12 = 84 - 12$$

$$2x = 72$$

$$\frac{2x}{2} = 72 \div 2$$

$$x = 36$$

36  
48

These are  
the two  
#'s

Mr Wortley is twice as old as Mr. Fisher. The sum of their ages is 75. How old are they?

$$\begin{array}{l}
 \text{Mr } F = x \quad 25 \quad \leftarrow \text{Mr } F \text{ is} \\
 \text{Mr } W = 2x \quad 50 \quad \text{Mr } W \text{ is} \\
 x + 2x = 75 \\
 3x = 75 \\
 3x \div 3 = 75 \div 3 \\
 x = 25
 \end{array}$$

One number is 10 more than another. The sum of twice the smaller plus three times the larger, is 55. What are the two numbers?

In a given amount of time, Jamie drove twice as far as Rhonda. Altogether they drove 90 miles.  
Find the number of miles driven by each.

Rhonda =  $x$  drove ~~30~~ <sup>30</sup> miles

Jamie =  $2x$  drove 60 mi

$$3x = 90$$

$$x = 30$$

4. The basketball teams of North Middle School and South Middle School played against each other twice this season. In the first game, North's score was two-thirds of South's score. In the second game, North's score increased by seven points from the first game while South's score decreased by seven points from the first game. In the second game South's score was three less than North's score, what was the score for each team in both games?

TEAM	1st GAME	2nd GAME
North MS	$\frac{2}{3}X$ 22	$\frac{2}{3}X + 7$ 29
South MS	$X$ 33	$X - 7$ 26

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

$$\frac{2x}{3} + 7 = x - 4$$

$$\frac{2x}{3} + 7 - 7 = x - 4 - 7$$

$$\frac{2x}{3} = x - 11$$

$$\frac{2x}{3} \times 3 = 3(x - 11)$$

$$2x = 3x - 33$$

$$\cancel{2x} - \cancel{2x} = 3x - 2x - 33$$

$$= x - 33$$

$$+ 33 = x - 33 + 33$$

$$33 = x$$