WALT understand algebra and its terms and symbols
Success Criteria I know …
- In algebra letters can be used to stand for unknown numbers
- H for height, P for price or population, T for temperature
- Letters and numbers can be combined
- 5 x n can be written as 5n

Let's write a story

Expression	Story
$3 \times b$	Packets of biscuits each have b biscuits in them. (b is not known.) Ahmed opens three packets of biscuits to serve at a party. The number of biscuits is $3b$.
$3 \times c - 5$	
$2 \times d + 10$	

Let's learn some terminology

1. **Pronumeral** - A letter or symbol used to represent number
2. **Constant term** -The part of the expression without any pronumeral
3. **Expression** -A group of mathematical terms that does not contain an equal sign
4. **Coefficient**- A numeral placed before a pronumeral
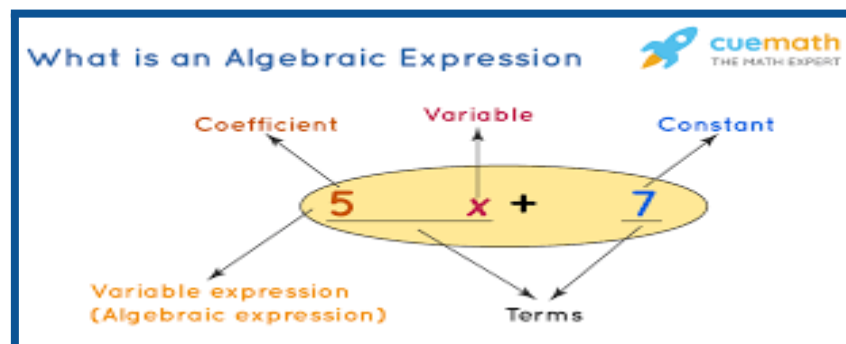
1. Which of the following is the common way to write $7 \times a$?

   A seven times a **B** $7a$ **C** a^7 **D** $\dfrac{7}{a}$

   In algebra, $5 \times b$ is written $5b$.

2. Which of the following is the common way to write $5 \div m$?

   A $\dfrac{m}{5}$ **B** five divided by m **C** $\dfrac{5}{m}$ **D** $5m$

Listing Terms

List the individual terms in the expression $3a + b + 13$.

Solution	Explanation
There are three terms: $3a$, b and 13.	Each part of an expression is a term.

Your turn to list terms

3. List the terms in each of the following.

   a $2x + 7y$ **b** $3a + 2c + e$ **c** $5q + 3r + 2s$ **d** $7d + 5f + 17$

Stating Coefficient

State the coefficient of each pronumeral in the expression $3a + 2b + 13c$.

Solution	Explanation
The coefficient of a is 3. The coefficient of b is 2. The coefficient of c is 13.	The coefficient is the number in front of a pronumeral.

Your turn now

4. **a** State the coefficient of x in $3x + 5y$.

   b State the coefficient of b in $7a + 13b + 5c$.

   c State the coefficient of k in $10 + 4k$.

5. For each of the following expressions, state:

   i the number of terms

   ii the coefficient of n

   Terms can be added or subtracted to form an expression.

   a $17n + 24$ **b** $31 + 27a + 15n$

   c $15nw + 21n + 15$ **d** $15a - 32b + 2n + 4xy$

   e $n + 51$ **f** $5bn - 12 + \dfrac{d}{5} + 12n$

Writing expressions from word descriptions

Write an expression for the following.

a 5 more than k **b** 3 less than m **c** the sum of a and b

d double the value of x **e** the product of c and d

Solution	Explanation
a $k + 5$	5 must be added to k to get 5 more than k.
b $m - 3$	3 is subtracted from m.
c $a + b$	a and b are added to obtain their sum.
d $2 \times x$ or just $2x$	x is multiplied by 2. The multiplication sign is optional.
e $c \times d$ or just cd	c and d are multiplied to obtain their product.

Write an expression for the following

6 Write an expression for the following.

 a 3 more than x **b** the sum of k and 5

 c 2 is added to b **d** 3 less than g

 e 4 is subtracted from H **f** 6 is subtracted from M

7 Write an expression for the following without using $\times$ or $\div$.

 a double the value of u **b** 4 lots of y

 c 3 is multiplied by x **d** the product of k and 10

 e y is divided by 8   **f** half of z

 g a is tripled, then 4 is added   **h** p is doubled, then 12 is added

'Product' tells you to use multiplication. The product of 3 and 10 is $3 \times 10 = 30$.

Problem Solving

8 In a room there are k people, and then 5 people leave. How many people are now in the room?

 A $k + 5$ **B** 5   **C** $k - 5$ **D** $5k$

9 Nicholas buys 10 lolly bags from a supermarket.
 a If there are 7 lollies in each bag, how many lollies does he buy in total?
 b If there are n lollies in each bag, how many lollies does he buy in total?

For part **b**, write an expression involving n.

10 Mikayla is paid \$$x$ per hour at her job. Write an expression for each of the following.
 a How much does Mikayla earn if she works 8 hours?
 b If Mikayla gets a pay rise of \$3 per hour, what is her new hourly wage?
 c If Mikayla works for 8 hours at the increased hourly rate, how much does she earn?

11 Recall that there are 100 centimetres in 1 metre and 1000 metres in 1 kilometre. Write expressions for each of the following.

a How many metres are there in x kilometres?

b How many centimetres are there in x metres?

c How many centimetres are there in x kilometres?

12 If b is an even number greater than 3, say whether these statements are true or false.

a $b + 1$ must be even.

b $b + 2$ could be odd.

c $5 + b$ could be greater than 10.

d $5b$ must be greater than b.

e $2b$ must be greater than 10.

f $\dfrac{b}{2}$ is a whole number.

⭐ Restaurant algebra

13 A group of people go out to a restaurant, and the total amount they must pay (in dollars) is A. They split the bill equally. Write expressions to answer the following questions.

a If there are 4 people in the group, how much do they each pay?

b If there are n people in the group, how much do they each pay?

c One of the n people has a voucher that reduces the total bill by $20.

    i How much does each person pay now?

    ii If the bill is $200 and $n = 6$, how much does each person end up paying?

Check your Answers

1 B **2** C

3 a $2x, 7y$ **b** $3a, 3c, e$ **c** $5q, 3r, 2s$ **d** $7d, 5f, 17$

4 a 3 **b** 13 **c** 4

5 a i 2 **ii** 17

 b i 3 **ii** 15

 c i 3 **ii** 21

 d i 4 **ii** 2

 e i 2 **ii** 1

 f i 4 **ii** 12

6 a $x + 3$ **b** $k + 5$ **c** $b + 2$

 d $g - 3$ **e** $H - 4$ **f** $M - 6$

7 a $2u$ **b** $4y$ **c** $3x$ **d** $10k$

 e $\dfrac{y}{8}$ **f** $\dfrac{z}{2}$ **g** $3a + 4$ **h** $2p + 12$

8 C

9 a 70 **b** $10n$

10 a $8x$ **b** $x + 3$ **c** $8(x + 3)$

11 a $1000x$ **b** $100x$ **c** $100\,000x$

12 a false **b** false **c** true

 d true **e** false **f** true

13 a $\dfrac{\$A}{4}$ **b** $\dfrac{\$A}{n}$ **c i** $\dfrac{\$A - 20}{n}$ **ii** $30