2.10A Modelling with Algebra Day 1

Ex. 1 State the correct operation.

twice $\times 2$

half $\div 2$ OR $\times \frac{1}{2}$

difference $-$

is $=$

product $\times$

quotient $\div$

fewer $-$

triple $\times 3$

reduced $-$

younger $-$

quarter $\div 4$ OR $\times \frac{1}{4}$

taken from $-$

GIZMO

Ex. 2 If *n* represents a number, write an algebraic expression using numbers and symbols for each of the following statements.

a) Three times a number $= 3n$ ← Means multiply

b) A number increased by one $= n + 1$

c) A number decreased by five $= n - 5$

d) Four more than twice a number $= 4 + 2n$

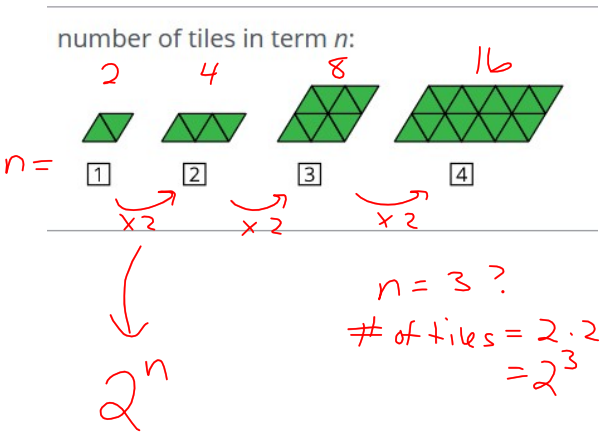
e) Half a number $\frac{1}{2}n$ OR $\frac{n}{2}$

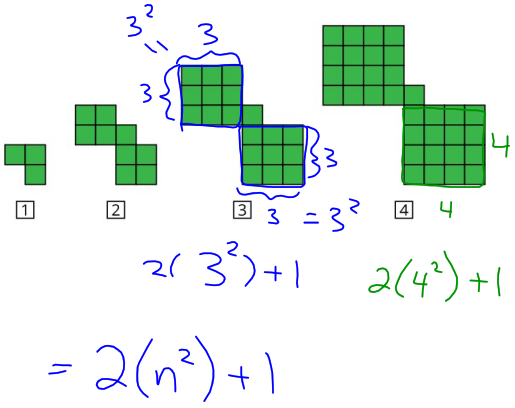
f) Double a number *that has been* reduced by six $= 2(n-6)$

g) A number subtracted from 4

$4 - n$

Ex. 3 These are growing patterns as the number is getting larger. Create an expression to represent each pattern with n representing the term number 1,2,3, etc.





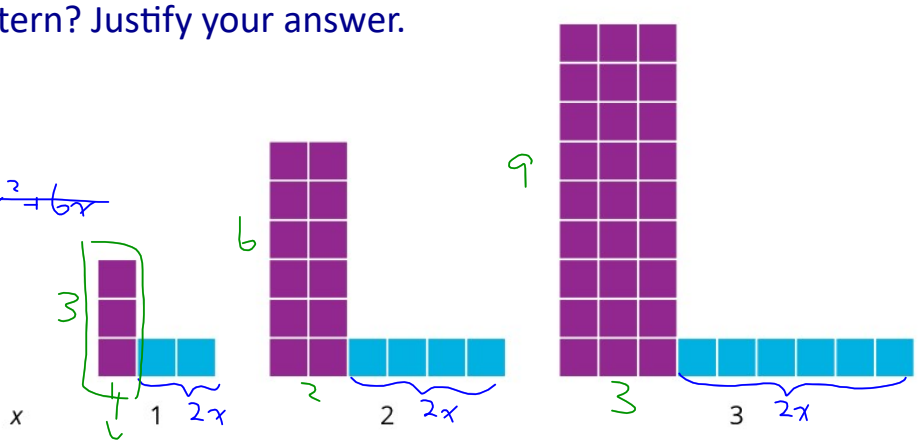
Ex. 4 The first three terms of a pattern are shown below, where *x* represents the term number. Which of the following expressions represents this pattern? Justify your answer.

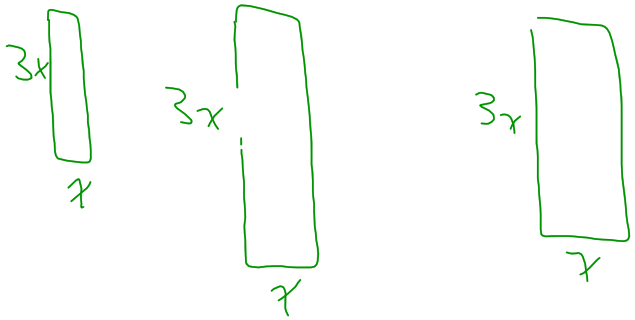
~~a) $3x + 2x$~~

b) $3x^2 + 2x$

~~c) $3x(x + 2) = 3x^2 + 6x$~~

d) $x(3x + 2)$





Problem Solving Steps

1) Write "let" statements. Be very specific.
2) Write an equation. Use one variable only.
3) Solve.
4) Write a conclusion.
5) Reflect. Is your answer reasonable?

Ex. 5 Number Problems

a) A number divided by 2, increased by 6 is 11. Find the number.

Let n represent the number.

$$\frac{n}{2} + 6 = 11 \quad (\times 2)$$

$$n + 12 = 22$$

$$n = 22 - 12$$

$$= 10$$

∴ The number is 10

b) One number is 2 more than 3 times another number. If the sum of the numbers is 14, what are the numbers?

(+2, 3n; ADD)

Let n be the first number

Let $3n+2$ be the second number

$$n + 3n + 2 = 14$$

$$4n = 14 - 2$$

$$\frac{4n}{4} = \frac{12}{4}$$

$$n = 3$$

Second number

$$3(3) + 2$$

$$= 9 + 2$$

$$= 11$$

∴ The two numbers are 3 & 11

c) Double the square of a number is increased by 2 resulting in 52.
What is the number?

Let n represent the number

$2n^2 + 2 = 52$
$2n^2 = 52 - 2$
$\frac{2}{2}n^2 = \frac{50}{2}$
$\sqrt{n^2} = \sqrt{25}$
$n = \pm 5$

d) Find two consecutive numbers with a sum of 149.

Let n represent the first number
Let n+1 " " second "

$n + n + 1 = 149$
$2n = 149 - 1$
$\frac{2n}{2} = \frac{148}{2}$
$n = 74$

Second number
$n + 1$
$= 74 + 1$
$= 75$

∴ The two numbers are 74 & 75