**Refresh Evaluating expressions**

A collection of symbols such as $10 - 4N$, $x - 12$, $5a^2 + 2b + 4$ or $\frac{2}{5}C + 32$ is called an algebraic expression, or simply an expression.

Expressions like these are built up by adding a number of terms (which may be positive or negative). In the first expression above there are two terms: 10 and $-4N$.

An algebraic expression contains one or more symbols, such as $N$, $x$ or $c$ in the expressions above, standing for unspecified numbers: these symbols are often called variables.

The number by which a variable is multiplied is called its coefficient. In the expressions above the coefficient of $N$ is $-4$, the coefficient of $x$ is 1, that of $a^2$ is 5 and that of $C$ is $\frac{2}{5}$.

Any term in an expression which is just a number is called a constant. The constants in the above expressions are 10, $-12$, 4 and 32.

**Forming algebraic expressions**

When working on a mathematical problem, it is often necessary to translate words into algebraic expressions.

**Substitution in expressions**

Values of an expression can be found by substituting numbers for symbols.

**Example 1**

(a) Find the value of $4N + 8$ when $N = 5$, $-3$, 0.
(b) Find the value of $2x^2 - 3$ when $x = -2$.

**Solution**

(a) When $N = 5$, $4N + 8$ becomes $4 \times 5 + 8 = 20 + 8 = 28$.
   When $N = -3$, $4N + 8$ becomes $4 \times -3 + 8 = -12 + 8 = -4$.
   When $N = 0$, $4N + 8$ becomes $4 \times 0 + 8 = 0 + 8 = 8$.
(b) When $x = -2$, $2x^2 - 3$ becomes
   $2 \times (-2)^2 - 3 = 2 \times 4 - 3 = 8 - 3 = 5$.  

Note that $-4N$ is an abbreviated way of writing $-4 \times N$. 

Remember that ‘BIDMAS’ applies.