Today we are going to see why being able to simplify expressions is so useful.
Recall that in algebra, variables just represent numbers.

For example, consider the monomial 3x. This just means "3 times the number x".

When x = 1, then 3x = _____

When x = 5, then 3x = _____

When x = 10, then 3x = _____

When x = 100, then 3x = _____

When x = 0.5, then 3x = _____

When x = 3.14, then 3x = _____

This is called substitution. Substitution is…

Try the following substitutions:

a) $2x + 1$ when $x = 4$

b) $x^2 - 1$ when $x = 10$

c) $3x + 2x + 1 + 4$ when $x = 2$

d) $5x + 5$ when $x = 2$

What do you notice about the answers to c) and d)?

KEY IDEA: When substituting a number for a variable…

Examples: **Simplify each** of the following expressions, **then find the value** of the expression.

a) $3a + 2a – 1 + 5 + 4a$ when $a = 1$

b) $3x^2 – x – 2x^2 + 4x$ when $x = 2$

c) $2(5x + 3) + 5x$ when $x = -1$

d) $3m(m – 1) + 2m(m + 3)$ when $m = 4$

In higher grades, you will be modeling real life scenarios with algebra, and substitution will be a tool that you must have in order to be successful.