***Words to Math***

Letters can be used to represent unknown numbers, which are called variables. Numbers and variables can be combined to form simple equations or expressions.

**Expression** => Formula without an equals sign

 3$x$ + 4

**Equation** => Formula with an equals sign

 3$x$ + 4 = 1

**Words can be used to describe these equations and expressions.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Add** | **Subtract** | **Multiply** | **Divide** |
| **Sum**PlusIncreased byAdded toMore than | **Difference**Less than (reverse order)Decreased byMinusReduced by | **Product**TimesOfMultiplied byTwice/Triple/etc. | **Quotient**Divided byPerFor every/eachAverage (by # of items) |
| **Miscellaneous** |
| **Equals** | **Variables** | **Exponents** | **Brackets** |
| IsEqualsIs equal toGivesResults inbecomes | A number | Squared (2)Cubed (3)Power of (>3) | Brackets are used when there are commas in the sentence and or when using: sum, difference, product, and quotient |

You can also just write a positive or negative sign inside the tiles to represent positive or negative.

Algebra Tiles can also be used to represent expressions, and equations:

The squares represent 1’s (Positive & Negative = adding 1 or subtracting)

The lines represent a number (one tiles = $x$ or y or z, etc. Either positive or negative = +2$x$ vs -2$x$)

To show division with Algebra Tiles just break the numerator into the number of groups determined by the denominator.

**Large Squares represent a number squared (e.g. x2):**

**Examples (Write & Show With Algebra Tiles):**

1. The product of seven, and two less than a number.
2. The product of seven and a number, minus two is twelve.
3. The quotient of a number and twelve, plus twenty-five is twenty-seven.
4. 3$x$ + 4
5. $\frac{x}{5}+5=10$

***Writing & Showing Algebra***

Name: Div.: Date:

**Write an equation for each sentence, and diagram it using algebra tiles:**

1. Four times a number is twenty.
2. A number divided by two equals five.
3. Six more than a number is fifteen.
4. A number increased by five is twelve.
5. A number decreased by six is ten.
6. Four less than a number is seven.
7. The square of a number is twenty-five.
8. Ten decreased by a number is two.
9. Three more than a number is eighteen.
10. A number decreased by six is negative eight.
11. The difference between 16 and the product of five and a number is one.
12. The quotient of one hundred and a number, plus thirty is eighty.
13. Three times the sum of thirty-three and a number is one hundred fifty.
14. The quotient of a number and twelve, plus twenty-five is twenty-seven.
15. The sum of a number and seventeen, divided by three is ten.

**Write the equations for each statement:**

1. There are 16 more white keys than black keys on a full sized piano keyboard. There are 88 keys on a piano.
2. Brad has $12 more than Pietro. Together they have $84.
3. Mike is seven years older than Carol. The sum of their ages is 29.
4. The population of Japan is about 4.5 times the population of Canada. The sum of the populations of the two countries is 150 million.
5. Niagara Falls has two parts. The American Falls are 2m higher than the Horseshoe Falls. The average height is 58m.