The number of inches in *n* feet.	Age in human years of your dog when she has lived *n* years	Number of weeks in *n* days	Your actual height *h* when you are wearing 2 inch shoes.
12*n*	7*n*	$n \div 7 \text{ or } \dfrac{n}{7}$	*h - 2*
The product of 12 and n	7 times more than *n*	*n* divided by 7 quotient of *n* and 7	Two less than your height
2n + 2n + 2n + 2n + 2n + 2n	6*n* + *n*	$\dfrac{1}{7}$ n	*h – (1 + 1)*
5 feet = 72 inches	10 year old dog = 70 in human years	28 days = 4 weeks	60 in. with shoes = 58 in. barefoot

Points for *n* touchdowns without extra point	Ounces in *n* cups	Your approximate age when you enter grade *n*	Number of quarters still needed to make $10 when you have *n* quarters
6n	8n	n + 5	($10 – $.25n) ÷ $.25
The product of 6 and n	Increase by a factor of 8 8 times more	n increased by 5 sum of n and 5	The quotient of (the difference in value of ten dollars and n quarters) and (.25)
2n + 2n + 2n 3(2n)	16n ÷ 2 2 (4n)	(2n + 10) ÷ 2	(1000 – 25n) ÷ 25
Perimeter in *n* inches of a regular hexagon	Perimeter in *n* inches of a regular octagon	Total *n* minutes of exercise if you always cool down for five minutes	Number of quarters left of your $10 roll of quarters after paying parking $.25 per hour for *n* hours

Points for *n* touchdowns without extra point	Ounces in *n* cups	Your approximate age when you enter grade *n*	Number of quarters still needed to make $10 when you have *n* quarters

$0.0625x = y$	Massachusetts sales tax on an item costing x dollars	$186,000x = y$	Number of miles light can travel in x seconds
$9/5\ x + 32 = y$	Temperature in Fahrenheit for x degrees Celsius	$3.1415927x = y$	Approximate distance around a circle whose diameter is x inches
$220 - x = y$	Theoretical maximum heart beats per minute for person x years old	$(x\text{-}2)*180 = y$	Number of interior degrees in a polygon with x sides
$x/5 = y$	Approximate number of miles sound can travel in x seconds	$y = x^3$	Volume of a cube with side length x units
$x - 5 = y$	Time in Boston given x time in London	$x + 3 = y$	Time in Boston given x time in Los Angeles

Hints for sorting Equations/Formula

1. In Fahrenheit water boils at 212 degrees and freezes at 32. In Celsius, freezing is 0 degrees and boiling is 100 degrees.

2. In London when it is 12:00 Noon, it is only 7:00 AM here in Boston.

3. It takes the sun's light about 3 hours to reach California (because of the speed of the earth rotation.) So if it is 12:00 in Boston it's only 8:00 Am in California.

4. Average heart rate is about 60 beats per minute. Maximum heart rate for a 15 year old is about 205 beats per minute.

5. If you count to five after you see lightning, and then hear thunder, the storm is 1 mile away. If you count to 10 before the thunder, the storm is 2 miles away. Sound takes longer to arrive than light.

6. If you buy a $1.00 item in Massachusetts, it will cost about $1.06 when you add the tax.

7. The angles in a triangle (3 sides) measures 180 degrees. A square 360. Pentagon = 540.

8. The circumference of a circle is about 3 times longer than the diameter.

9. Light travels at about 186,000 miles per second.

After Sorting Equations/Formulas
Option #1: Create an Open Response Question

Using the expressions from the equation sort, create 3-5 word problems for other students to solve. Make sure you include the worked out solutions.

Example: Maximum heart rate = 220 – (n) (where n is age in years)

1. George is 10 years old and his dad is 45 years old.

    A. What is the difference in their theoretical maximum heart rates (per minute)? Explain your thinking.

    B. If George is at his maximum, how many beats will George's heart make in 10 seconds?

    C. George's trainer told him to exercise at 60% of his maximum heart rate. If he takes his pulse for 6 seconds, how many beats should he feel?

Worked Out Answers:

A. maximum heart rate = 220 – n (where n = age)

George's age = 15   Dad's age = 45

220 – 10 =210 hearts beats for George 220–45 =175 heart beats for Dad

210 – 175 = 35 There is a 35 beat per minute difference

B.   **beats x minutes = total beats** 10 seconds is 1/6 of a minute

      210 beats per minute x 1/6 min = 35 beats in 10 seconds

      210 * 1/3 * ½ = 35

C. 60% of maximum for George. George maximum = 210 * 60%

(10% = 21) (60% = 126)

126 beats per minute is his maximum. 6 seconds is 1/10 of a minute.

So 1/10 of 126 = 12.6

He should feel about 12 or 13 heart beats every six seconds.

After Sorting Equations
Option #2:   Present An Equation

1. Choose one of the formulas/equations from the sorting sheet.

2. Identify the dependent and independent variable. Create a statement like this: "The maximum number of heartbeats ***depends*** on a person's age. If a person is 100 years old then the maximum heart rate is 220-100 = 120 beats per minute. The independent variable is age; the dependent variable is the heart rate."

3. Choose 4-6 different values for the independent variable (x) and make a table to show the dependent variable (y). (Make an input/output table.)

4. Graph the results of your input output table. Label the x and y axis.

5. Be prepared to present your equation to others.

Jobs:
1. Give an overview of the equation you chose and explain why it is a useful equation (and why you chose it.)
2. Explain the independent and dependent variables and make a statement like, "the _____ depends on _____. For example, if...
3. Show and explain the input/out table and how you got your results.
4. Show and explain the graph and any problems you had.

Scoring:
1. Loud and right pace (not too fast or too slow) (2 points)
2. All jobs done well and accurate. (6 points)
3. Smooth, feels like you have rehearsed (2 points)

n - 4	5 – n	5n	n/4
Difference of n and 4	Difference of 5 and n	Product of 5 and n	Quotient of n and 4
4 less than n	n less than 5	n increased by factor of 5	n split into 4 parts
4 fewer than n	n fewer than 5	Rate of 5 per n	¼ of n
n is decreased by 4	5 is decreased by n	n + n + n + n + n	25% of n
I finished 4 seconds faster than last year	She had 5 points but lost some points	4n + n	½ (1/2 n)
I lost 4 points due to poor sportsmanship	I have n points. Need this much to get to 5	10n/2	2n/8
I am 4 years younger than n	5 – 1n	(10n)(1/2)	$(n \div 2) \div 2$

n - 4	4 − n	4n	$\dfrac{n}{4}$
Difference of n and 4	Difference of 4 and n	Product of 4 and n	Quotient of n and 4
4 less than n 4 taken from n	Take away 4 from n n less than 4	n increased by factor of 4	n split into 4 parts
4 fewer than n	n fewer than 4	Rate of 4 per n	¼ of n
n is decreased by 4	4 is decreased by n	n + n + n + n	25% of n
I finished 4 seconds faster than last year	She had 4 points but lost some points	3n + n	$\left(\frac{1}{2}\right)\left(\frac{1}{2}n\right)$
I lost 4 points due to poor sportsmanship	I have n points. Need this much to get to 4	$\dfrac{8n}{2}$	$\dfrac{2n}{8}$
I am 4 years younger than n	$\dfrac{4}{1} - 1n$	(2n)(2)	$\dfrac{n}{(2)(2)}$

Describe each expression in as many ways as you can. Use words, equivalent expressions, real world situations…

n + 7	2 (n + 3)	3n	12/n