MODELLING WORD PROBLEMS USING LINEAR SYSTEMS

To **MODEL** a word problem using a system of linear equations you must:

1) Declare your variables using "LET" statements
2) Create each of your Equations

MODEL means to set up in mathematical form

TYPES OF LINEAR SYSTEM PROBLEMS

In our class there are **TWO** types of linear system problems that can be modelled.

FIRST
is when you have a single SCENARIO under different conditions.

Example:

① Jason weighs six kilograms less than twice Bill's weight.

② If the sum of their weights is 102 kilograms, how much does each person weigh?

Let J be Jason's weight

Let B be Bill's weight

① $J = 2B - 6$

② $J + B = 102$

SECOND
is when you have two SCENARIOS under similar conditions.

Example:

Karl's Towing charges $80 plus $0.22/km. (①) Bev's Towing charges $70 plus $0.30/km. (②)

Write a linear system to represent this problem. Which towing company would you use? Explain.

Let C be the total cost of towing

Let k be the # of km towed

① $C = 0.22k + 80$

② $C = 0.30k + 70$

Examples:

Model each of the word problems using a system of linear equations.
You **DO NOT** need to solve the problems.

1. Jill makes two types of quilts.
The first type costs $25 for fabric and $40 per hour for hand quilting.
The second type costs $50 for fabric and $22 per hour for machine quilting.
For what number of hours are the costs the same? **MODEL this problem.**

Let C be the cost for a quilt
Let h be # of hours needed

① $C = 40h + 25$

② $C = 22h + 50$

2. A band held a concert in its hometown. A total of 15 000 people attended.
The tickets cost $8.00 per student and $12.50 per adult.
The concert took in a total of $162 500.
How many adults came to the concert? **MODEL this problem.**

Let x be # of adult tickets sold
Let y be # of student tickets sold

① $x + y = 15\,000$

② $12.50x + 8y = 162\,500$