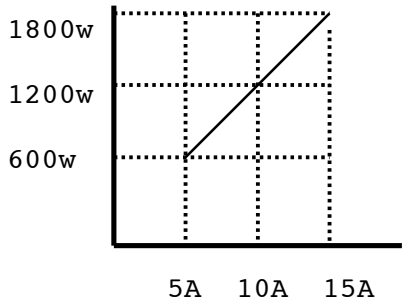
Proportional and Inverse Relationships

A ***proportional relationship*** is when one variable stays proportional to another as they both change in relation to a third, fixed amount.

An example of this is when you're driving a car. There are three variables – speed, time and distance. Let's fix the driving time at one hour. If you DOUBLE your speed, you can DOUBLE the distance you travel in the hour. If you TRIPLE your speed, you can TRIPLE the distance you travel in the hour. The two variables (speed & distance) change proportionately, if the third variable (time) doesn't change.

Another example is our formula **A X V = W.** If the voltage is fixed (120V?), then an increase in the wattage requires a proportional increase in the amps:

Assuming 120V,
in order to double the watts,
you need to double the amps.
To triple the watts,
You need to triple the amps.



An ***inverse relationship*** is like the flipside of a proportional relationship. One variable changes as the inverse (1/X) of the other variable. If one variable is doubled, the other variable is cut in half.

Take the driving example again. Let's fix the distance at 10 km. If you DOUBLE your speed, you get there in ONE-HALF the time. If you TRIPLE your speed, you get there in ONE-THIRD the time. The two variables (speed and time) change inversely to each other, if the third variable (distance) doesn't change.

In **A X V = W,** amps and volts have an inverse relationship, if the watts don't change.

Assuming 600w,
if you double the amps,
you cut the volts in half.
And if you triple the amps,
you cut the volts to one third