Ohm's Law / Watt's Law *Description and practical example:*

Ohm's Law states the relationship between **voltage**, **current** and **resistance**. Given the relationship between these three elements, once you know any two of them, it is possible to calculate the third. Watt's Law is similarly useful in figuring out the relationship between **power**, **voltage** and **current**.

Electrical properties:

- Electromotive Potential, measured in Volts, is represented by V (or E)
- Current, measured in Amperes, is represented with the letter I
- Resistance, measured in Ohms, is represented by R (or the Greek letter Ω)
- Power, measured in watts, is represented by the letter W

According to Ohm's Law :

Volts = Current multipied by Resistance	V = I * R
Current = Volts divided by Resistance	I = V / R
Resistance = Volts divided by Current	R = V / I

According to Watt's Law :

Power = Volts multiplied by Current	P = V * I
Power = Current squared times Resistance	$P = I^2 * R$

Real world example:

Suppose you wanted to figure out how many 500-watt lighting instruments you could plug into a circuit without blowing a fuse.
First, you would need to know how much current can be drawn through the circuit. Most homes have 15 amp circuits installed. At MassArt, most of the circuits are on 20 amp circuit breakers. So the total power available would be:

W = V x I (Watts = Volts x Amps)
or ? = 110 x 20

We multiply the volts times the amps (which are known quantities) and see that:

110v x 20amps = 2200 watts

So whatever we plug into our circuit has to be less than 2200 watts, because that's all the power available in this circuit.

Answer: You could safely plug four 500-watt lights into the circuit (or two 1000watt lights) -with a 200watt safety margin.

500 + 500 + 500 + 500 = 2000 watts