$I = \dfrac{Q}{t}$ $V = \dfrac{W}{Q}$ $E = VIt$ $V = IR$ $Q = Ne$ $e = 1.6 \times 10^{-19}\ C$

$R_S = R_1 + R_2 + R_3 + \ldots$ $\dfrac{1}{R_P} = \dfrac{1}{R_1} + \dfrac{1}{R_2} + \dfrac{1}{R_3} \ldots$ $P = IV$ $P = I^2R$ $P = \dfrac{V^2}{R}$

List outcomes here:
Current Electricity Theory:

1. Define electric current, state its unit, list the equation defining electric current.

2. List three types of energy that may be used to produce current, and list three devices that provide this type of energy.

3. List three types of loads and list the energy conversions taking place inside each one.

4. What is the definition of voltage? What is its unit?

5. Prove that 1 J is equivalent to 1 V·A ·s.

6. How long does it take a current of 5.0 mA to deliver 15 C of charge?

7. What is the potential difference between two points if 1.0 kJ of work is required to move 0.5 C of charge between the two points?

8. What is the voltage of a source which provides 12.0 J to each Coulomb of charge present?

9. What is the energy of an electron accelerated through a potential difference of 100.0 kV? (charge of an electron given above)

10. What is the potential difference between two points when a charge of 80.0 C has 4.0×10^3 J of energy supplied to it as it moves between the two points?

11. There is a current of 0.50 A through an incandescent lamp for 5.0 min, with a voltage of 115 V. How much energy does the current transfer to the lamp? What is the power rating of the lamp?

12. If there is a current of 2.0 A through a hair dryer transferring 15 kJ of energy in 55 s, what is the potential difference across the dryer?

13. An electric drill operates at a potential difference of 120V and draws a current of 6.0 mA. If it takes 45 s for the drill to make a hole in a piece of wood, how much energy is used by the drill?

14. An electric toaster operating at a potential difference of 115 V uses 34 200 J of energy during the 20.0 s it is on. What is the current through the toaster?

15. A motor draws a current of 2.0 A for 20.0 s in order to lift a small mass. If the motor does a total of 9.6 J of work calculate the voltage drop across the motor.

16. In a lightning discharge, 30.0 C of charge moves through a potential difference 10^8 V in 20 ms. Calculate the current of the lightning bolt.

17. How much energy is gained by an $\overline{e}$ accelerated through a potential difference of 3.0×10^4 V?