

Chapter 17

Introduction

to Electricity

17-3

Electrical Calculations

Essential Questions

- What is the formula for Ohm's Law?
- How do you determine voltage, current and resistance using the formula for Ohm's Law?
- How do you calculate electrical power?
- How do you determine the electrical energy used by a device?

Vocabulary

- Electric power – how fast electrical energy is changed into other forms of energy

Connecting Current, Voltage and Resistance

- Ohm's Law: resistance and current have an inverse relationship
 - Ex: $R \uparrow$ then $I \downarrow$, so when $R \downarrow$ then $I \uparrow$

Volts (V) = resistance (Ω) x current (amps)


Memorize this: $\frac{V}{R I}$

Electric Power

- Rate of electrical energy changing into other types of energy is electrical power

Power = Volts x Current

Memorize this: $\frac{P}{VI}$

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- Watt
 - Tells the power of light bulbs
 - Higher watt means more light
 - Kilowatt = 1000 watts


Measuring Electrical Energy

- Electric companies calculate amount of energy used by multiplying power in kilowatts by time in hours

Electrical energy = power x time

Memorize this: $\frac{E}{PT}$

answer is in kilowatt-hours (kWh)

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- How to Save Energy
 - Replace items that have high power ratings with low ones
 - Change light bulbs to long-lasting bulbs
 - Turn off lights and appliances when not in use