Static Electricity

Static Electricity:
Produces 'Static Charges', meaning that the charge(s) are stationary on the surface of the object that was rubbed.If the object gains electrons, it has negative charge.Loses electrons, positive charge.To charge, must rub an object that takes electrons w/ one that gives electrons.

Different Ways of Charging

Different Ways of Charging:
• Induction, without direct contact
• Friction, rubbing 2 different insulators together
• Conduction, touching a charged insulator to a conductor

Conductors and Insulators

Conductors are a group of materials that allow for electrons to pass through them easily.There are two types, good conductors (metals) and fair conductors (allow for passage just not as much as fair conductors).Insulators are materials where electrons can't move easily through them.

Primary/Secondary Cells

Primary cells can only be used once and secondary cells can be recharged and reused over and over again.

Efficency

Is the measure of how much useful energy the electrical device produced over the amount it has used.You would measure this by using the formula
Eout(energy out, produced energy)/Ein(Energy in, the amount of energy being used)x100%.

Series and Parallel Circuits

Series Circuits have only one path for the electrons to follow and Parallel Circuits have more than one.The more loads you add to series circuit, the more resistance you will have and the less current you will have.Also, if you increase the number of loads in a series circuit, the voltage drop across each circuit decreases.The current flowing through a load in a parallel circuit is less than the current flowing through the energy source.The resistance in a parallel circuit is only the load resistance.The voltage drop of a load in a parallel circuit will be the same as the drop across the source..

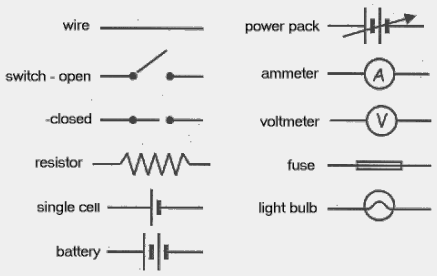
Potential Difference

This is also called voltage.Potential Difference is the difference in electrical potential energy per unit at two different points in the circuit.The device used to measure this is the voltmeter, the unit is the volt and the symbol is V.You can only measure this by placing the voltmeter parallel to a load.

Ohm's Law

	Resistance	Electrical Current	Potential Difference
Measures	Opposition to Flow	Electron Flow	Force
Symbol	R	I	V
Measure in	Ohms (Greek Delta)	Ahms(A)	Volts(V)
Device	Ohmmeter	Ahmmeter	Voltmeter
Formula	R= V over I	I = V over R	V=I x R

Circuit Symbols



Electrostatic Series

Electrostatic Series:
It determines whether or not the substance has a strong or weak hold on electrons.

The Law of Attraction

The Law of Attraction:
If the two objects have like charges (ex positive, positive), they repel.
If they have unlike terms (ex positive, negative), they attract.

Charging by Conduction

Occurs when two objects with different amounts of electric charge come in contact with one another and the electrons move from one another.It does not always have to be between a charged object and a neutral one.The electrons always move from the object w/ more electrons to the one w/ less.

Electric Discharge

This occurs when 2 objects that have a charge imbalance are brought close together or come in contact.The greater the imbalance, the greater the discharge will be.Small discharges cause shocks and big discharges can damage electronic equipment.

Electrical Power

Is the rate at which electrical energy is used/produced in a given time.This is measured in watts(w).1 watt=1 joule per second (J/s).The higher the wattage, the more energy is being used/produced.

Power

P(Watts)=Energy divided by delta T(Time(seconds)
P=Voltage x I(Current)

Measuring Electrical Energy

Measure by formula
Energy(Joules)=Voltage Drop (V) x Current (A) x Time Interval (s)
OR
Energy (Watt Hours (Wh))=Voltage Drop (V) x Current (A) x Time Interval (h)

Resistance

This is the ability of a material to resist the flow of electrons(current).Insulators tend to have a high resistance, conductors a low resistance.The device used to measure this is the Ohmmeter, the unit is the ohm and the symbol is the Greek Omega.The greater the resistance, the lower the current and vice versa.A Resistor is a device put in the circuit to limit the current.When using a graph, the slope is the resistance(find by using rise over run)

Electrostatic Series Diagram

Charging by Friction

Always one material will lose electrons and the other will gain.Usually occurs when you rub two objects together.Using the electrostatic series, you can determine which material will lose/gain electrons.

Weather

Static electricity is more common in colder weather as the cold air is drier.The more humid the air is, the harder it is for the object to maintain a charge.

Grounding

Excess charges can be removed from an object through grounding.This process is used by removing the excess charge to a large neutral object(mostly the Earth).The electrons move to the Earth if the object is negatively charged, from the Earth if it is positively charged.

Induction

Induction is where a charged object is used to charge a neutral object without contact.It can be charged both permanently and temporarily.
Temporary Charge:
When the charged object is brought close to the neutral object, the electrons in the neutral object are forced to shift in position.If the charged object is charged negatively, the electrons will move away and the object will be temporarily charged positively.Vice versa for a negative object.Once the object is taken away, the electrons return to normal.
Permanent Charge:
The neutral object can be charged by grounding it when you bring the charged object close to it.The object that was originally charged will keep it's charge where the neutral object will be the opposite charge.

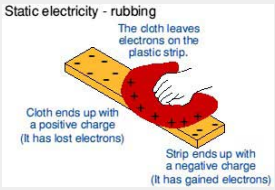
Direct/Alternating Current

Direct current is when the electrons only flow in one direction and it's produced by an electric cell.Alternating current is where the electrons move back and forth, alternating directions.This type can only be produced by generators.

Cost of Electricity

Measure by the formula:
power used x time x cost of electricity

Static Electricity Diagram



Induction Permanent Charge Diagram