Chapter 20: Electricity

Section 20.1 – Electric Charge and Static Electricity

- _____ is a property that causes subatomic particles such as _____ to attract or repel each other.
- The SI unit of electric charge is the _____.
- _____ have a _____ and _____ have a _____ charge.
- A cloud of negatively charged _____ surrounds the positively charged _____.
- The atom is _____ because it has an equal number of positive and negative charges.
- If an atom _____ electrons, it becomes a _____ charged ion.
- If an atom _____ electrons, it becomes a _____ charged ion.
- _____ charges _____, and _____ charges _____.
- The force of _____ between electrically charged objects is _____.
- The electric force between two objects is _____ to the net charge on each object and _____ to the square of the distance between them.
- The effect an _____ has on other charges in the space around it is the charge's _____.

- The _____ of an electric field depends on the _____ that produces the field and on the _____ from the charges.
- The more _____ an object has, the _____ is the force on it.
- The _____ of each field line shows the direction of the force on a _____.
- _____ is the study of the behavior of electric charges, including how charge is _____ between objects.
- The _____ states that the total charge in an isolated system is constant.
- Charge can be transferred by _____.
- Rubbing a balloon on your hair is an example of _____.
- _____ move from your hair to the balloon because atoms in rubber have a greater _____ for electrons than atoms in your hair.
- When a girl touches the _____ generator sphere, she acquires a charge large enough to make her hairs stand on end.
- You pick up extra _____ when you walk across a carpet, so your hand is _____.
- The net negative charge in your hand repels the _____ in the metal doorknob.
- Overall, the doorknob is still _____, but charge has moved within it.

- A transfer of charge _____ between materials is _____.
- The _____ you feel when touching a doorknob is _____.
- _____ occurs when a pathway through which charges can move forms suddenly.
- _____ is static discharge that occurs because charge can build up in a storm cloud from _____ between moving air masses.

Section 20.1 Assessment

- How is a net electric charge produced?

- What determines whether charges attract of repel?

- Name two factors that affect the strength of an electric field.

- List three methods of charge transfer.

- Explain how static discharge occurs.

- How does electric force depend on the amount of charge and the distance between charges?

- What is the law of conservation of charge?

- When a glass rod is rubbed with neutral silk, the glass becomes positively charges. What charge does the silk now have?

Section 20.2 – Electric Current and Ohm's Law

- A continuous flow of electric charge is an _____.
- The SI unit of electric current is the _____, or amp, which equals 1 coulomb per second.
- The two types of current are _____.
- Charge flows only flows in one direction in _____.
- A flashlight and most battery-operated devices use _____.
- _____ is a flow of electric charge that regularly reverses its direction.
- Electrons flow from the _____ terminal of a battery to the _____ terminal of a battery.
- The current is in the _____ direction because current is the direction in which _____ charges would flow.
- An _____ is a material through which charge can flow easily. Examples include _____.
- A material through which charge cannot flow easily is called an _____. Examples include _____.

- _____ tend to be electrical _____ because they are made up of an ion lattice.
- The _____ cannot move, but the electrons can move.
- This mobile electron lattice is known as the _____.
- As _____ move through a wire, they collide with other particles which converts some kinetic energy into _____.
- _____ is opposition to the _____ of charges in a material.
- The SI unit for resistance is the _____.
- A material's _____ affect its resistance.
- Resistance is _____ in a longer wire because the charges move _____.
- As temperature _____, a metal's resistance _____ because electrons collide more often.
- A _____ is a material that has almost zero resistance when it is cooled to low _____.
- In order for charge to _____ in a conducting wire, the wire must be connected in a complete _____ that includes a source of _____.
- _____ is the difference in electrical potential energy between two places in an _____.
- Potential difference is measured in joules per coulomb, or _____.
- Potential difference is also called _____.

- Charges flow from _____ potential energy.
- Three common voltage sources are _____.
- A _____ is a device that converts _____ to electrical energy.
- According to _____, the voltage (V) in a circuit equals the _____ of the current (I) and the resistance (R).

V =
I =
R =

Section 20.2 Assessment

- List the two types of current.
- Name two good electrical conductors and two good electrical insulators.
- What variables affect the resistance of a material?
- What causes charge to flow?
- According to Ohm's law, how is voltage related to resistance and current?

- Suppose you have two wires of equal length made from the same material. How is it possible for the wires to have different resistances?

- Use Ohm's law to explain how two circuits could have the same current but different resistances.

Section 20.3 – Electric Circuits

- An _____ is a complete path through which charge can _____.
- _____ use symbols to represent parts of a circuit, including a _____ of electrical energy and _____ that are run by the electrical energy.
- _____ show places where the circuit can be _____.
- If the switch is _____, the circuit is not a complete loop, and the current stops. This is called an _____.
- When the switch is _____, the circuit is complete and charge can flow. This is called a _____.
- The + and – on the _____ symbol indicate the positive and negative _____.
- In a _____, charge has only _____ path through which it can flow.
- If one _____ stops functioning in a series circuit, _____ of the elements can operate.
- The more _____ you have, the less brightly they shine.

- A _____ is an electric circuit with _____ paths through which charges can flow.
- If one _____ stops functioning in a parallel circuit, the rest of the elements can still _____.
- The _____ at which electrical energy is _____ to another form of energy is _____.
- The unit of electric power is the joule per second, or _____.
- Electric power can be calculated by _____ voltage by current.

P =
I =
V =

- An electric oven is connected to a 240 volt line, and it uses 34 amps of current. What is the power used by the oven?

- A clothes dryer uses about 27 amps of current from a 240 volt line. How much power does it use?

- A camcorder has a power rating of 2.3 watts. If the output voltage from its battery is 7.2 volts, what current does it use?

- A power tool uses about 12 amps of current and has a power rating of 1440 watts. What voltage does the tool require?

- Correct _____, fuses, circuit breakers, insulation, and _____ plugs help make electrical energy _____ to use.
- A _____ prevents current overload in a circuit.
- A _____ is a switch that opens when current in a circuit is too high.
- The transfer of _____ charge through a conductor to Earth is called _____.

Section 20.3 Assessment

- Name two elements included in a circuit diagram.
- What is the difference between a series circuit and a parallel circuit?
- Write the equation for calculating electric power.
- Name five safety devices used with electric current.
- You plug in a string of holiday lights and notice that the entire string turns off when you remove one bulb. Explain why this happens.
- A stereo receiver uses a current of 2.2 amps from a 120 volt line. What is its power?

- A television connected to a 120 volt line uses 102 watts of power. How much current flows through it?