

Electricity Unit Review Science 10

Define each of the following:

Static electricity
electrostatics
law of electric charge
insulator
conductor

series circuit
parallel circuit
charging by contact
charging by friction
charging by induction

discharge
electric potential
resistance
voltage
electric circuit
ohm's law

Answer each of the following questions:

1. What particles in the atom move when electrical charge is transferred from one atom to another?

The electrons move when charge is transferred from one atom to another

2. Which of the following is not part of the electrical nature of matter (circle the incorrect answer)
- All matter is made up of subatomic particles called atoms
 - At the center of the atom is the nucleus in the center are the (+) and (0) charges, around the orbit are the (-) charges.
 - If atoms gain electrons they become positively (+) charged
3. If each of the following items were rubbed together state which would be (-) and which would be (+)
- A cotton sweater (-) and a pair of wool pants (+)
 - Your hair (+) and a plastic comb (-)
 - Your silk pj's (+) and your cotton sheets (-)

4. Explain why static electricity is worse in the winter?

There is less moisture in the air in the winter so there are fewer water molecules to remove charges from charged surfaces.

5. Name and explain two ways to discharge objects.

Static wicks – electrons flow off the tip of the rod into the air.

Grounding – the earth absorbs the built up charges

6. Name the parts of an electric circuit and give an example of each one.

Source – cell or battery (provides the energy)

Load – toaster, light bulb (is given the energy)

Connecting wires – copper, aluminum (connect the various parts of the circuit)

Control device – switch, thermostat (controls if the load is on or off)

7. What is the difference between a closed circuit and an open circuit?

A closed circuit is one in which electricity is flowing. An open circuit is one in which there is a break in the flow of electricity.

8. What is the difference between static electricity and current electricity?

Static electricity stays in one place on an object and current electricity is an electric charge that is moving in one or more paths.

9. In which direction does electricity flow and why?

The electric charge flows from the negative terminal of the dry cell, through the switch, the bulb and back to the positive terminal of the dry cell. Negative charges are released at the negative terminal are attracted to the positive terminal.

10. What is the difference between a series circuit and a parallel circuit? If both a series and parallel circuit have the same amount of load, which will have the least resistance?

A series circuit is when the parts of the circuit are wired to one another in a single path.

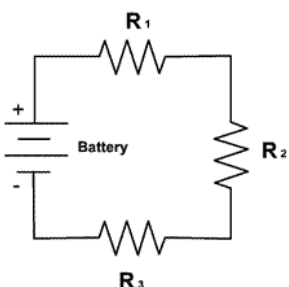
A parallel circuit is when the parts of the circuit are each on their own separate branch.

The parallel circuit would have the least amount of resistance, there are multiple paths through which current can flow, so the resistance of the overall circuit is lower than it would be if only one path was available.

11. a. Is the following diagram an example of parallel or series? This is an example of a series circuit

b. If R1 was to stop working explain what would happen to R2 and R3. Give reasons for your answer.

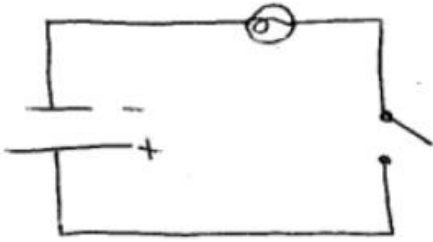
If R1 stopped working neither R2 nor R3 would work. This is a series circuit and if there is a break anywhere in the path it will not work.



12. Draw the following as schematic circuit diagrams:

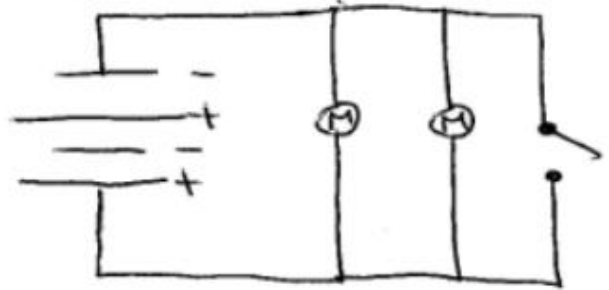
a) 1 battery
1 lightbulb
switch

Series



b) 2 batteries
2 loads
1 control

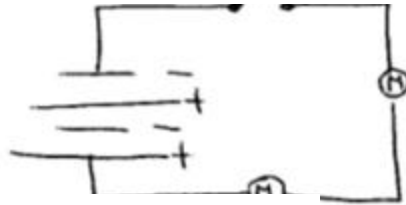
parallel



c)

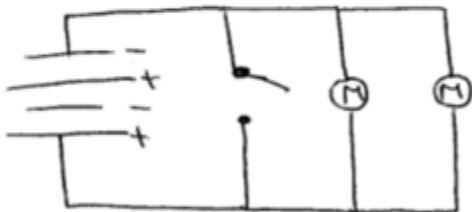
2 batteries
switch
2 motors

Series



d)

2 batteries
switch
2 motors



13. What is the symbol and unit of measurement for each of the following:

- electrical potential/voltage **V**, volts
- electric current **I**, amps
- electric resistance **R**, Ω

14. Complete the following table using Ohm's law.

	Voltage	Current	Resistance
a)	110V	2A	55 Ω
b)	110V	1.1A	100 Ω
c)	16V	2A	8 Ω
d)	220V	0.44A	500 Ω
e)	12V	0.03A	400 Ω