Checklist:

Static Electricity

1) Law of Electric Charges

2) Charging by Friction - know how to use electrostatic series
- know how to draw diagrams of electrons moving when two neutral objects are rubbed together

3) Charging by Contact - Diagrams of pith-ball of electroscope and positive and negative rods

4) Use the electrostatic series to determine charge on two objects that have been rubbed

5) Conductors & Insulators - definitions of each and know materials that are conductors/insulators

6) Lightning - how it happens (diagrams of how lightning occurs)

7) Applications of Static Electricity: reason plastic balloons stick to the wall (using diagrams)

Current Electricity

1) Parts of an Electric Circuit (including definition, and examples)

2) Drawing circuit diagrams (need to know how to draw all the circuit symbols for various circuits)

3) Calculations (resistance calculations using V=IR)

4) Graphing voltage and current and calculating resistance from slope

5) Cells/Batteries in Series and Parallel

6) Loads in Series and Parallel (calculating V and I in different parts of the circuit)

Electricity Review Questions

1. State the three laws of electrostatics.

   LIKE CHARGES REPEL LIKE CHARGES

   UNLIKE CHARGES ATTRACT UNLIKE CHARGES

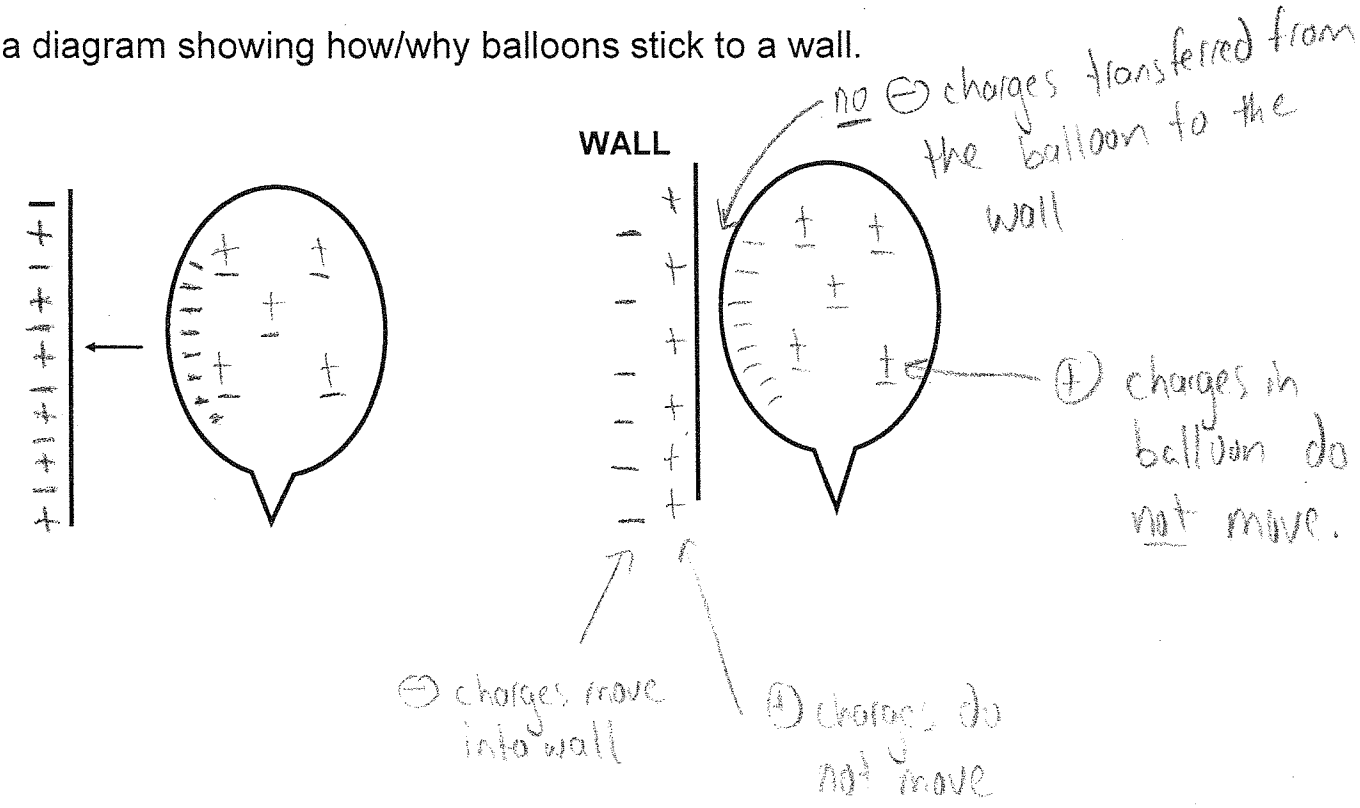
   NEUTRAL OBJECTS ARE ATTRACTED TO BTH POSITIVE AND NEGATIVE OBJECTS

2. Use the Electrostatic Series when you trying to determine the charge of two objects that have been charged by friction. Also explain WHY the electrons move from one substance to another substance.

   MATERIALS THAT HAVE A WEAKER HOLD ON THEIR ELECTRONS WILL LOSE THEIR ELECTRONS TO MATERIALS THAT HAVE A STRONGER HOLD ON THEIR ELECTRONS.

   MATERIALS THAT <u>LOSE</u> ELECTRONS BECOME <u>POSTIVE</u>.
   MATERIALS THAT <u>GAIN</u> ELECTRONS BECOME <u>NEGATIVE</u>.

3. Draw a diagram showing how/why balloons stick to a wall.



4. Use the Electrostatic Series below to answer the following questions. Fill in the blanks, stating the charge ("+" "-") or on each object **after** rubbing. **[3 marks]**

Material	Hold on Electrons
Acetate	*Weak*
Glass	
Wool	
Cat's fur, human hair	
Silk	
Aluminum, zinc	
Cotton	
Paraffin wax	
Ebonite	
Polyethylene (plastic)	
Carbon, copper, nickel	
Rubber	
Sulphur	
Platinum, gold	*Strong*

i) A gold ring is rubbed with a piece of silk:

gold becomes **NEGATIVE**

silk becomes **POSITIVE**

ii) A glass test tube is rubbed with wool

test tube becomes **POSITIVE**

wool becomes **NEGATIVE**

iii) Wool is rubbed with a silk:

wool becomes **POSITIVE**

silk becomes **NEGATIVE**

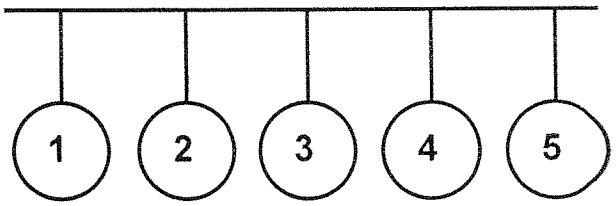
5. When a negatively charged rod is brought near, but does not touch an uncharged (neutral) with ball electroscope, the ball will:

a) move away from the charged rod
b) move toward the charged rod only
c) stay where it is
d) move toward and then away from the charged rod

6. When a positively charged rod is brought near, and touches an uncharged (neutral) pith ball electroscope, the ball will:

a) move away from the rod
b) move toward the rod only
c) stay where it is
d) move toward and then away from the charged ro

7. Using the law of electrostatics (attraction/repulsion) to identify the charges on each of the **FIVE** pithballs described in each situation. Pithballs can be **POSITIVE**, **NEGATIVE**, or **NEUTRAL**.



#4 attracts all except #3
#2 attracts #3
#1 and #5 repel each other
#3 and #4 repel each other
#1 is negatively charged

Ball # 1 is **−** Ball #2 is **N** Ball # 3 is **+** Ball #4 is **+** Ball #5 is **−**

8 The flow of electric current in a circuit:

a) is from the positive terminal of the cell/battery to the negative terminal of the cell/battery
b) is from the negative terminal of the cell/battery to the positive terminal of the cell/battery
c) depends on if the cells/batteries are hooked up in series or parallel
d) depends on if the loads (light bulbs, motors) in a circuit are connected in series or parallel

9. Neutral objects are attracted to charged objects because of:

a) mutual magnetism
b) a vacuum occurs between them
c) the movement of electrons in the neutral object
d) the movement of protons in the neutral object

10. What is the function of a load in a circuit? What are three examples of loads in a circuit?

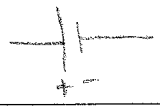
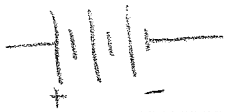
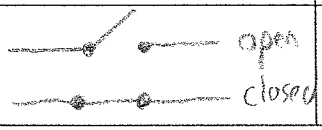
THE FUNCTION OF THE LOAD IS TO USE THE ELECTRICAL ENERGY IN THE CIRCUIT. THE LOAD CAN BE...

① A LIGHT BULB (CONVERTS ELECTRICAL ENERGY INTO LIGHT ENERGY)

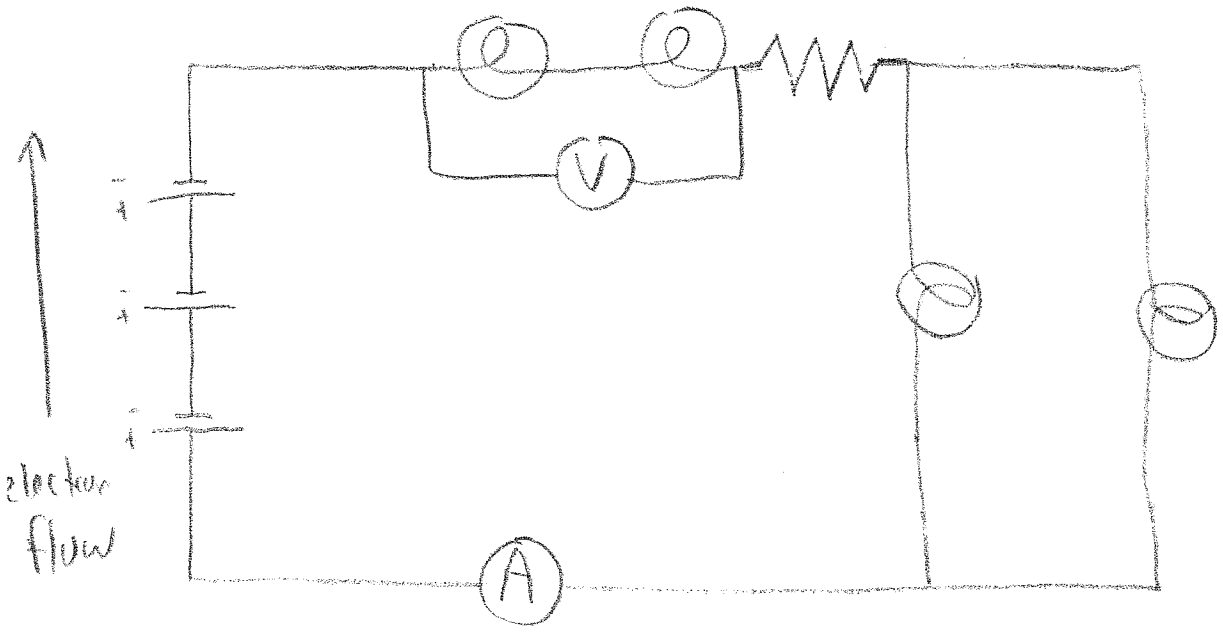
② A HEATER (CONVERTS ELECTRICAL ENERGY INTO HEAT ENERGY)

③ A MOTOR/FAN (CONVERTS ELECTRICAL ENERGY INTO MECHANICAL ENERGY)

11. Complete the following table

What is it?	Circuit Symbol	What is it?	Circuit Symbol
Lamp		Cell	
Resistor		fuse	
3-celled battery		Voltmeter	
Switch		Ammeter	

12. Using proper symbols draw a circuit diagram for the following circuit. The circuit is composed of 3 cells connected in series, connected to 2 light bulbs connected in series, and followed by 2 light bulbs connected in parallel. A resistor has been inserted between the light bulbs in series and the light bulbs in parallel. Include a voltmeter positioned to measure the potential difference across the two light bulbs in series. Finally, include an ammeter positioned to determine the current going back into the 3 cells.



V = ?

13. What is the potential difference/voltage drop across a fan that has resistance of 60 Ω and a current of 2 A? Write out the equation and solve. **[120 V]**

R I

V = IR

V = 2A x 60Ω

V = 120 V

R = ?

14. Calculate the resistance of a conductor if the potential difference/voltage between its ends is 12V and the current through it is 0.54 A. **[22.2 Ω]**

V I

V = IR

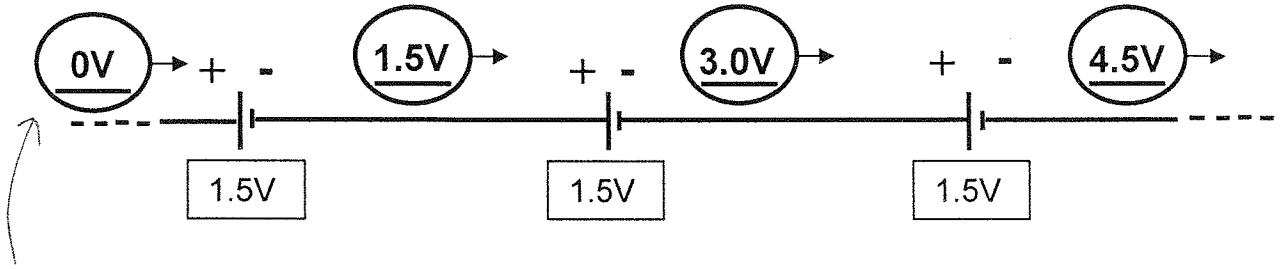
12V = 0.54A x R

$$\frac{12V}{0.54A} = R$$

22.2Ω = R

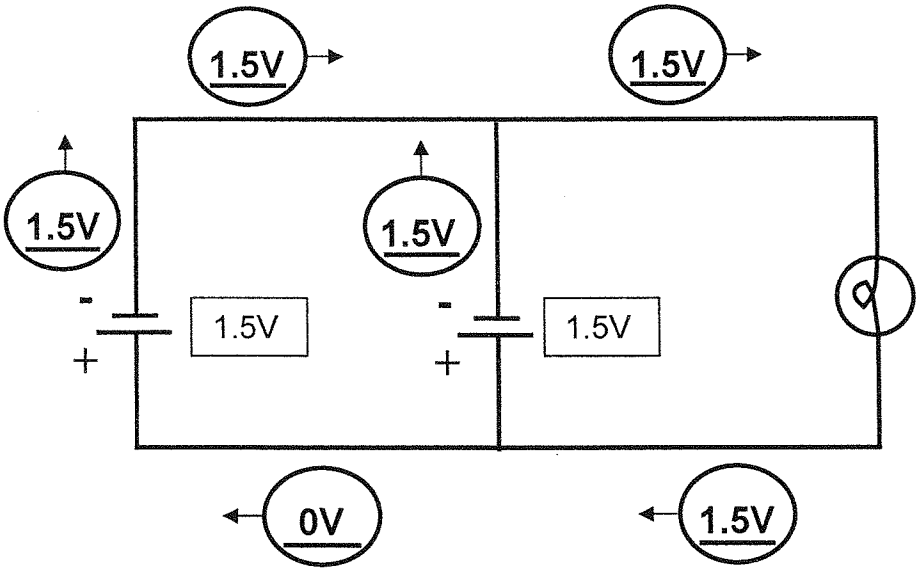
15. Fill in the blanks for the following two diagrams with the proper voltages.

a) The following cells are connected in SERIES/PARALLEL (circle one)



electrons going back into the source (cells or batteries)

b) The following cells are connected in SERIES/PARALLEL (circle one)



15. Fill in the blanks for the following with the proper current values for each part of the circuit.