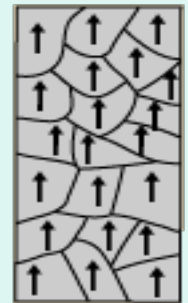


Electricity and Magnetism

Study Guide

1. **Static Charge – build up of charges on an object**
2. **Circuit – continuously flowing closed loop of electricity**
3. **Parallel circuit – circuit that has two or more separate paths for electrons**
4. **Series circuit – allows only one route for current to flow**
5. **Electromagnet – a current carrying wire wrapped around an iron core.**
6. **Direct current – current that does not reverse direction ex. Battery**
7. **Alternating current – current that reverses direction ex. Electrical outlet**

8. **Resistance – measure of how difficult it is for electrons to flow through a material**
9. **Current – steady flow of electrons through a conductor**
10. **Conductor – material through which electrons readily flow**
11. **Insulator – material through which electrons do NOT readily flow**
12. **Magnetic domain – group of atoms with their fields pointing in the same direction**
13. **Electric Discharge – When a charge is built up between two different objects and the charge is released**



13. Describe how two like charges will react to each other and two unlike charges will react to each other.

unlike charges attract –like charges repel

14. Explain the movement of electrons in an insulator and in a conductor.

In an insulator electrons do NOT move freely. In a conductor, electrons do move freely.

15. Classify each of the following as either a conductor or an insulator.

Wood -**insulator**

Glass - **insulator**

Copper - **conductor**

d. Human body – **conductor**

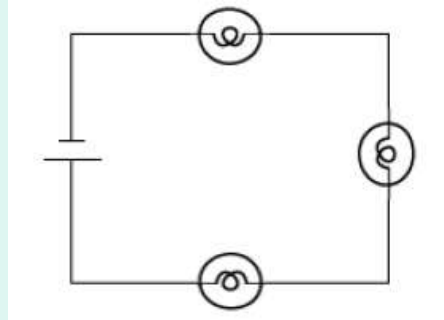
e. Silver - **conductor**

f. Rubber - **insulator**

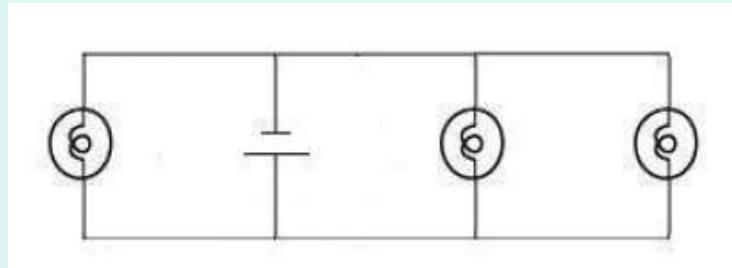
16. Describe the strength of a magnetic field as you move closer to the charge and farther away from the charge. **The field gets stronger as you get closer to a charge.**
17. Why is copper used in household wiring? **Copper has a low resistance.**
18. Which poles in a magnet are attracted to each other? Which poles repel each other?
- ***Two north poles or two south poles would repel – like poles repel**
 - ***A north and a south pole would attract – opposites attract**
19. An iron magnet is broken into two pieces. Explain the magnetic poles in each of the new pieces. **Two north poles and two south poles 2 new magnets would be created each with a north and a south**
20. Where on a magnet is the magnetic field strongest? Weakest? **Strongest at the poles Weakest away from poles**

21. Explain the arrangement of domains in a magnet. **Domains are all lined up in a magnet**
22. Where does the aurora borealis mainly appear? Why? **Near the poles – that is where the magnetic field is strongest**
23. Decreases – **lines are further apart**
Increases – **lines are closer together**
24. How does changing the current affect an electromagnet? **Changing the current changes the strength and direction of the electromagnet**

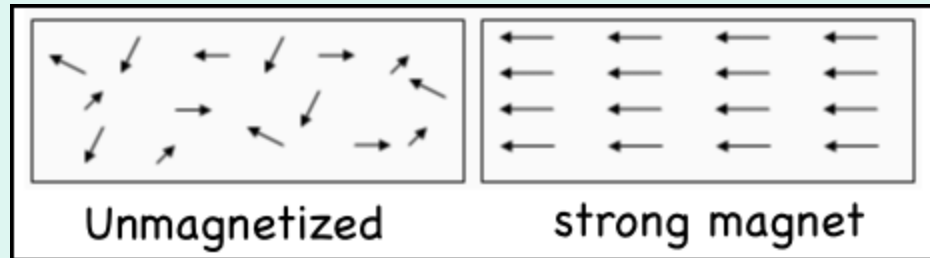
25. Draw an example of a series circuit.



26. Draw an example of a parallel circuit.



27. Draw a picture and explain the arrangements of the magnetic domains in a magnet. **Domains are lined up!**



28. The north end of a compass points to which geographic pole? Explain your answer. **The north end of a needle in a compass is attracted to the North Pole because the North Pole is really the magnetic South of earth's magnetic field.**
29. How can you adjust the coil wires on an electromagnet to make the electromagnet stronger? **Adding more coils will make the electromagnet stronger.**
30. Give an example of a Ferromagnetic material. **Nickel, Iron, Cobalt**
31. Explain the energy transformation of an electric motor. **Electrical to Mechanical**

32. Explain the energy transformation of a generator. **Mechanical to electrical**
33. Suppose you have a series circuit with two bulbs and you add an additional bulb to the circuit. How will the addition bulb affect the other bulbs? Explain. **The bulbs will be dimmer due to increased resistance caused by the additional bulb.**
34. Suppose you have a parallel circuit with two pathways. There is one bulb in each pathway. An additional bulb is added to one of the pathways so that one pathway now has two bulbs and the other pathway still only has one bulb. How will the additional bulb added to one of the pathways affect the brightness of the bulb in the OTHER pathway? The pathway with the additional bulb?
The two bulbs together in the same pathway will be dimmer than the one bulb in the other pathway.
- If you add an additional pathway with another bulb, all bulbs will be the same brightness, original bulbs will NOT dim.**

35. What will happen to the resistance of a circuit if you increase the current? Decrease the current? **Increased current = decreased resistance. Decreased current = increased resistance. Current flows fast with less resistance.**

36. What will happen to the current of a circuit if you increase the voltage? Decrease the voltage? **Increased current = Increased voltage. Decreased current = Decreased voltage.**

37. What causes a charge to move through a circuit? **Voltage**

38. What is an ampere? **Unit for measuring current**

39. Explain how magnetism and electricity are related. Both have a magnetic field moving around them. Both involve electrons.

Magnetism is due to lined up electrons on an atom facing the same direction. Electricity is a result of moving electrons through a conductor.

40. What is the magnetosphere? **The area of Earth's magnetic field shaped by solar winds.**

Static charge	copper	Attracts a north pole	Lined up
It has a low resistance	Series circuit	Magnetic poles	Opposite charges
Near the poles	insulator	Only operating when the current is on	Electric current
Two north poles and two south poles	Get closer to a charge	Parallel circuit	Strongest at the poles