Science 9

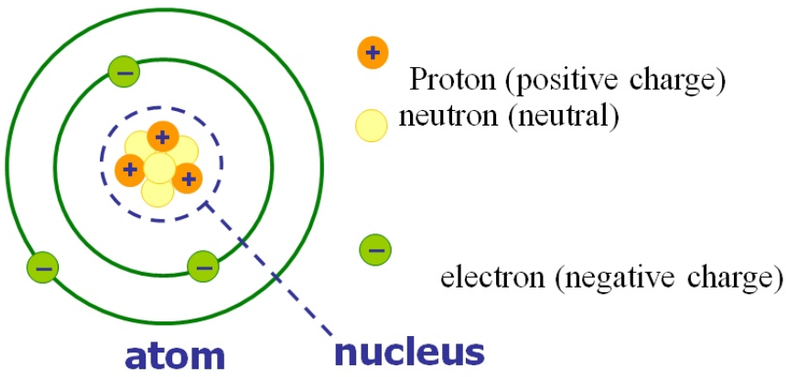
Unit 3: Static Electricity

Worksheet 1: Static Electricity and The Atomic Theory

Static electricity refers to stationary electrical charge that is built up on the surface of a material.

Electrostatics refers to the interaction between static electric charges

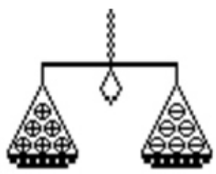
Matter is made up of atoms



Static Electricity can never be explained by the movement of protons and neutrons because they are trapped in the nucleus. ***It is the movement of the electrons that is important***

<u>Neutral vs. Charged Objects</u> :

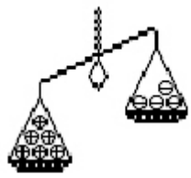
Neutral refers to having equal number of protons and electrons



NEUTRAL
NO CHARGE

Charged refers to having an imbalance of electrons. Objects can be charged in two ways:

1) **Positively charged** having more protons than electrons. In order for this to occur, electrons have to leave the object.



POSITIVE
CHARGE

2) **Negatively charged** having more electrons than protons. In order for this to occur, electrons have to move onto the object.

NEGATIVE
CHARGE

PART A: MULTIPLE CHOICE

1. Which of the following would be an example of static electricity?

   (A) Getting a shock from touching a door nob.
   (B) Plugging in an electric kettle
   (C) Frying an egg on an electric stove
   (D) Batteries in an mp3 player

2. Which of the following is NOT a situation caused by static electricity?

   (A) hair stands on end when touching a static electricity generator
   (B) you get a electric shock when touching a doorknob during dry winter
   (C) your hair stands on end when you are frightened
   (D) clothes in the dryer cling to one another when no fabric softener is used

3. The term "static" means?

   (A) Always moving
   (B) Not moving
   (C) Positive
   (D) Neutral

4. What does the picture below illustrate?

   (A) Electromagnetism
   (B) Current Electricity
   (C) Static Electricity
   (D) Grounding

5. Which of the following proved that lightning was caused by a build-up of static electricity in the storm clouds.

   (A) Albert Eienstein
   (B) Benjamin Franklin
   (C) Isaac Newton
   (D) Stephen Hawking receptive daydream

6. What is the charge of an electron?

   (A) Positive
   (B) Negative
   (C) Neutral
   (D) Stationary

7. The transfer of what type of atomic particle is responsible for the static charges on objects?

   (A) neutrons
   (B) electrons
   (C) protons
   (D) clingons

8. What is the term used to describe the electricity which results from a build up of electric charges on an object?

   (A) Current Electricity
   (B) Electroscope
   (C) Grounding
   (D) Static electricity

9. What are the two kinds of electric charges?

(A) Electron and neutron
(B) Negative and proton
(C) Neutral and charged
(D) Positive and negative

10. Which of the following sub atomic particles move to cause static electricity?

(A) Electron
(B) Neutron
(C) Protons
(D) Protons and Electron

11. When an uncharged object loses electrons, what type of charge does it develop?

(A) Ionic
(B) Negative
(C) Neutral
(D) Positive

12. How does a negatively charged object become neutral?

(A) It gains electrons.
(B) It gains protons.
(C) It loses electrons.
(D) It loses protons.

13. An object that is positively charged:

(A) has gained protons
(B) has lost protons
(C) has gained electrons
(D) has lost electrons

PART B: WRITTEN RESPONSE

1. What happens to the charge on a neutral object when it gains electrons? [1]

_____

_____

_____

2. Why don't protons move to give an object a charge? [1]

_____

_____

_____

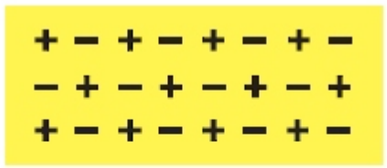
3. Explain with the aid of a diagram how an object can become positively charged . [1]

_____

_____

_____

4. State whether each of the objects below is negative, positive, or neutral. [3]

(A) 

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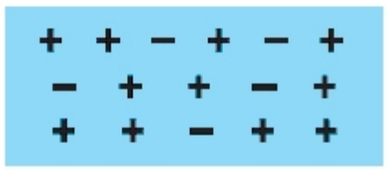
(B) 

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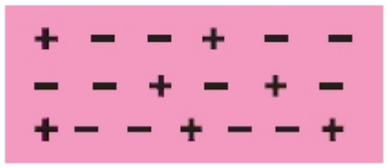
(C) 

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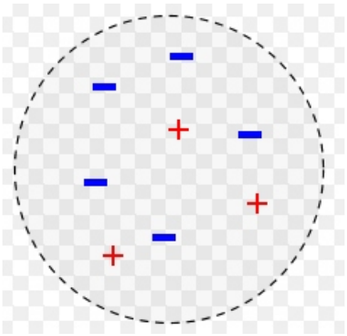
5. Use the picture below to answer the following questions:



(A) Number of Electrons: _____

_____(B) Number of Protons:_____

_____

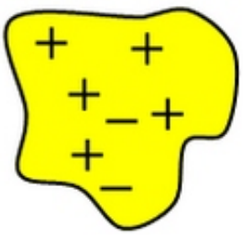
(C) How can this object be made neutral?

_____

_____

_____

6. The picture below illustrates a piece of material that is positively charged. Use the picture to answer the following questions



(A) Number of Electrons: _____

_____(B) Number of Protons:_____

_____

(C) How can this object be made neutral?

_____

_____

_____