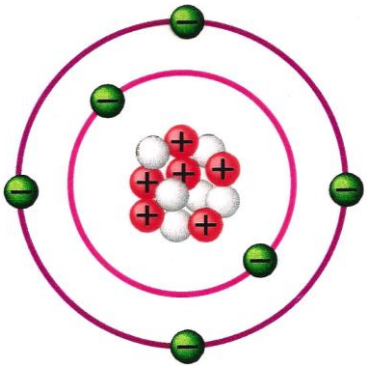
Electric force and Charge (Page 1)

1. Name, draw and label the parts of an atom:



2. What is the charge of the electrons, protons and neutrons?

3. Like charges_____ and opposite charges _____

4. What does the Law of Conservation of Charge say?

Electric Fields and Potential (Page 2)

Complete the chapter 33 exercises below:

Electric Fields and Potential (Page 2)

Complete the chapter 33 exercises below:

33.1 Electric Fields (pages 665–666)

1. What is an electric field?

2. Like a gravitational field, an electric field has both _____ and _____

3. How can the magnitude of an electric field be measured?

4. Is the following statement true or false? The direction of an electric field at any point, by convention, is the direction of the electrical force on a small *negative* test charge, placed at that point. _____

5. Consider the electric field around a small positive charge. How can you describe the direction of the field?

33.2 Electric Field Lines (pages 666–667)

6. Since an electric field has both magnitude and direction, it is a _____

7. Is the following sentence true or false? In a vector representation of an electric field, the magnitude of an electric field is indicated by the length of the vector arrows. _____

8. Electric fields can also be described by using field lines (or lines of force). In a field lines representation of an electric field, the field is weaker where the lines are _____

33.3 Electric Shielding (pages 668–669)

12. If the charge on a conductor is not moving, the electric field inside the conductor is exactly _____

13. Circle the letter of each statement that is true about charged conductors.
    a. The absence of an electric field within a conductor holding static charge arises from the inability of an electric field to penetrate metals.
    b. The absence of an electric field comes about because free electrons within the conductor stop moving when the electric field is zero.
    c. The charges arrange themselves to ensure a zero field within the material.
    d. If the conductor is not spherical, then the charge distribution will not be uniform.

14. Why are some electronic components and some cables encased in a metal covering?

33.4 Electrical Potential Energy (pages 669–670)

15. Is the following sentence true or false? A charged object has potential energy by virtue of its location in an electric field. _____

16. Circle the letter of each statement that is true.
    a. No work is required to push a charged particle against the electric field of a charged body.
    b. The electrical potential energy of a charged particle decreases when work is done to push it against the electric field of something else that is charged.
    c. The energy a charge has due to its location in an electric field is called electrical potential energy.
    d. If a charge with electrical potential energy is released, its electrical potential energy will transform into kinetic energy.

33.5 Electric Potential (pages 670–671)

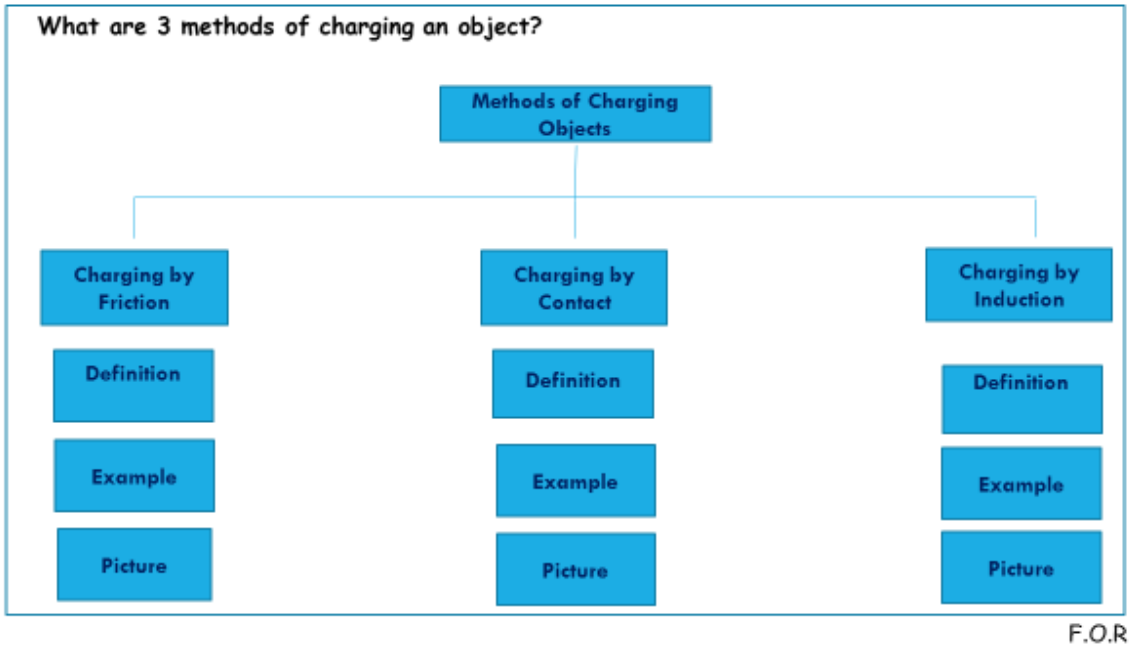
17. What is electric potential?

18. Is the following sentence true or false? Electric potential is *not* the same as electrical potential energy. _____

19. The SI unit of measurement for electric potential is the _____

Methods of Charging (Page 3)

1. Create a tree map about the 3 main methods of charging using the template below:



Coulomb's Law Formula and Relationship (Page 4)

1. How would a 300 N force between two charges change if the charge of both particles is doubled? **F=1200N**

2. Charges of 10C and 6C are 3 m apart and have a force of 50 N. They are changed to 30C and 24 C. How does the force change? (list the original values and new values) **F=600N**

3. Calculate the force between charges of 4.0×10^{-8} C and 1.5×10^{-7} C if they are 5 m apart. Is it an attractive or repulsive force? **F=2.16 x 10^{-6} N**

4. Two balloons are charged with an identical quantity and type of charge of -2.55×10^{-8} C and are held 0.512
   a. What is the force between them? **F=2.23 x10^{-5}N**
   b. Do these forces attract or repel? Explain why
   c. What would the force be if both charges were tripled? **F=2.01 x10^{-4}N**
   d. What would the force be if the distance was halved? **F=8.92 x10^{-5}N**