Station 1- Multiple Choice

*Directions: Re-write the question with correct answer in complete sentences.*

1. If you comb your hair and the comb becomes positively charged, your hair becomes

a. uncharged.

b. positively charged.

c. negatively charged.

1. When an electron is bought near a negatively charged sphere, its electric potential energy increases. What is the reason this happens?
   1. Work was done to bring the charges together
   2. Negative charges attract each other

c. Negative charges repel each other

d. None of the above.

1. Coulomb's law says that the force between any two charges depends

a. Directly on the size of the charges.

b. Inversely on the square of the distance between the charges.

c. Both A and B

d. None of the above

1. Two charges are separated by a certain distance. If the magnitude of each charge is doubled, the force on each charge is

a. halved.

b. doubled.

c. tripled.

d. quadrupled.

1. When the distance between two charges is tripled, the electrical force between the charges

a. triples.

b. increases by a factor of 9

c. decreases by a factor of 9.

d. quadruples.

1. Conservation of charge means that

a. the total amount of charge in the universe is constant.

b. no experimenter has ever seen a single charge destroyed by itself.

c. electrons by themselves can be neither created nor destroyed.

d. charge can be neither created nor destroyed.

e. all of the above

1. A difference between electrical forces and gravitational forces is that electrical forces include

a. infinite range.

b. repulsive interactions.

c. the inverse square law.

1. In a good conductor, electrons are usually

a. tightly bound in place.

b. free to move around.

c. being cancelled out

1. To be safe in the unlikely case of a lightning strike, it is best to be inside a building framed with

a. steel.

b. wood.

c. either A or B.

1. A rubbed balloon will stick to a wooden wall, which demonstrates charge

a. transfer.

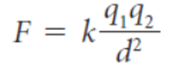
b. potential.

c. conservation.

d. polarization.

1. Suppose a hollow metal sphere (Van de Graaff generator) has a large negative charge on it. What is the electric field inside the sphere?
   1. Large and positive
   2. Weak and positive
   3. Weak and negative
   4. Zero

Station 1- Coulomb’s Law Formula/Relationship

 k= 9x109

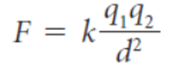
1. How would a 500 N force between two charges change if the charge of both particles is doubled? **F=2000N**
2. How would a 500 N force between two charges change if the distance is doubled? **F=125N**
3. Calculate the force between charges of 5.0 x 10-8 C and 2.5 x 10-7 C if they are 8 m apart. Is it an attractive or repulsive force? **F=1.75 x 10-6 N**
4. How would a 500 N force between two charges change if the charge of one of the particles is doubled? **F=1000N**
5. Calculate the force between two identical charges of size and type of 14 C if they are 7 m apart. Is it an attractive or repulsive force? **F=3.6 x 1010 N**
6. Calculate the force between charges of -4.0 x 10-4 C and -3.0 x 10-6 C if they are 0.918 m apart. Is it an attractive or repulsive force? **F=1.28 x 101 N**
7. Calculate the force between two charges of 8.7 C and 7.2 C that are 15 m apart. Is it an attractive or repulsive force? **F=2.50 x 109 N**

Station 2- Concept Questions

*Directions: Complete each of the following using complete sentences.*

1. What are similarities and differences between the electric force and the gravitational force?
2. What is charging by friction? Provide an example.
3. What is the difference between charging by contact and charging by induction? Provide an example of each.
4. Why are people safe inside a car struck by lightning? )Hint: think about the electric field INSIDE the car)
5. How do we represent an electric field? How do we indicate a stronger or weaker electric field?
6. What is the electric field inside a conductor when free charges arrange themselves on a surface?

Station 2- Coulomb’s Law Mixed Practice

 k= 9x109

1. A positive charge of 2.5 C and a second charge of 6.5 C are 5.4 m apart.

a. What is the force between them? **F=5.01 x109N**

b. Do these forces attract or repel? Explain why

c. What would happen to the force be if one charge were doubled?

d. What would happen to the force be if the distance doubled?

2. A charge of -6.5 C and a second charge of 5 C are 3.4 m apart.

a. What is the force between them? **F=-2.53 x1010N**

b. Do these forces attract or repel? Explain why

c. What would happen to the force be if both charges were doubled?

d. What would happen to the force be if the distance tripled?