Station 1- Chapter 32 Summary (ELECTROSTATICS)

*Directions: Re-write the summary by choosing one of the underlined words to complete the sentence.*

Every atom has a nucleus made of positively charged electron /proton and neutrally charged neutrons/protons surrounded by negatively charged protons/electrons. Electric/Magnetic forces come from these positively and negatively charged particles in atoms. Opposite charges repel/attract and like charges repel/attract. These forces are about 1039 times stronger than nuclear forces/gravitational forces. Atoms have as many protons as electrons and so have a neutral/average charge. An atom can gain or lose protons/electrons. The SI unit for charge is the coulomb/volt. The mass of an electron/proton is about 2000 times greater than the mass of an electron/proton. The law of conservation of charge says charges can/cannot be created nor destroyed, only charged/transferred. Coulomb’s/Newton’s Law relates the size of 2 charges and the distance between them to the force that they affect each other with. That force is directly related to the size of the charges/distance, and inversely related to the cube/square of the charges/distance between them. Conductors/Insulators loosely hold electrons and they move easily. Conductors/Insulators hold electrons tightly and they don’t move easily. Charging by contact is when 2 objects of different charge touch/rub each other and charges move to balance. Charging by induction/friction is when 2 objects rub together, electrons/protons can get transferred from one object to the other. Objects don’t even have to touch to get charged by induction/contact. If a charged object is brought near a neutral object, the opposite/like charges on that neutral object will be repelled away while the opposite/like charges will be attracted toward it.

Station 2- Coulomb’s Law Relationship



1. What does Coulomb’s Law State?
2. How would a 200 N force between two charges change if the charge of one of the particles is doubled? **F=400N**
3. How would a 200 N force between two charges change if the charge of both particles is doubled? **F=800N**
4. How would a 200 N force between two charges change if the distance is doubled? **F=50N**
5. How would a 200 N force between two charges change if the charge of one of the particles is halved? **F=100N**
6. How would a 200 N force between two charges change if the distance is halved? **F=800N**
7. Create 3 test questions similar to the questions above using another factor of change besides doubling and halving.
8. Solve the 3 test questions you created.

Station 3- Coulomb’s Law Formula

 k= 9x109

1. Write down and complete the following:

Force is \_\_\_\_\_\_\_\_\_\_\_ related to the size of the charge. Which means if one charge doubles then the new force will \_\_\_\_\_\_\_\_\_\_\_?

1. Write down and complete the following:

Force is \_\_\_\_\_\_\_\_\_\_\_ related to the \_\_\_\_\_\_\_\_\_\_ of the distance. Which means if one distance doubles then the new force will \_\_\_\_\_\_\_\_\_\_\_?

1. Calculate the force between charges of 4.0 x 10-8 C and 1.5 x 10-7 C if they are 4 m apart. Is it an attractive or repulsive force? **F=3.37 x 10-6 N**
2. Calculate the force between charges of -4.0 x 10-8 C and 1.5 x 10-7 C if they are 0.426 m apart. Is it an attractive or repulsive force? **F=-2.97 x 10-4 N**
3. Calculate the force between charges of -6.0 x 10-4 C and -2.0 x 10-6 C if they are 0.218 m apart. Is it an attractive or repulsive force? **F=2.27 x 102 N**
4. Calculate the force between two identical charges of size and type of 8 C if they are 3 m apart. Is it an attractive or repulsive force? **F=6.4 x 1010 N**
5. Calculate the force between two charges of 6.7 C and 8.2 C that are 7 m apart. Is it an attractive or repulsive force? **F=9.63 x 109 N**
6. Create 3 test questions similar to the questions above.
7. Solve the 3 test questions you created.

Station 4- Coulomb’s Law Mixed Practice

k= 9x109

1. A positive charge of 3.5 C and a second charge of 2.5 C are 2.4 m apart.

a. What is the force between them? **F=1.36 x1010N**

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 -3.5 C and a second charge of 2.5 C are 2.4 m apart.

a. What is the force between them? **F=-1.36 x1010N**

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?

3. A charge of -4.0 x 106 C and a second charge of 4.0 x 106 C are 0.215 m apart.

a. What is the force between them? **F=-3.11 x1024N**

b. Do these forces attract or repel? Explain why

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

d. What would happen to the force be if the distance was one third?

4. Two balloons are charged with an identical quantity and type of charge of

-4.55 x10-8 C and are held 0.812

a. What is the force between them? **F=2.82 x10-5N**

b. Do these forces attract or repel? Explain why

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

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

5. Create your own test question similar to the ones above and solve it.