Station 1- Coulomb's Law Relationship

$$F = k \frac{q_1 q_2}{d^2}$$

- 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 2- Coulomb's Law Relationship Original/New Value

$$F = k \frac{q_1 q_2}{d^2}$$

- 1. Why can the electrical force be both an attractive force and a repulsive force? (Be specific).
- Charges of 10C and 12C are 6 m apart and have a force of 40 N. They are changed to 20C and 24 C. How does the force change? (list the original values and new values) F=160N
- 3. Charges of 10C and 12C are 6 m apart and have a force of 40 N. They are changed to 10C and 48 C and are separated a distance of 12 m. How does the force change? (list the original values and new values) **F=40N stays the same.**
- Two charged spheres are 4 m apart attract each other with a force of 4.0 x 10⁶ N. How does the force change if both charges are doubled and the distance is tripled? F=1.77 x 10⁶ N
- Two charged spheres are 7 m apart attract each other with a force of 3.5 x 10⁶ N. How does the force change if one charge is tripled and the distance is cut in half? F=4.2 x 10⁷ N
- Charges of 2C and 2C are 10 m apart and have a force of 50 N. They are changed to 8C and 12 C. How does the force change? (list the original values and new values) F=1200 N
- 7. Create 3 test questions similar to the questions above.
- 8. Solve the 3 test questions you created.

Station 3- Coulomb's Law Formula

$$F = k \frac{q_1 q_2}{d^2}$$

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 _____?

2. 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 _____?

- 3. 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
- 4. 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=-3.37 x 10⁻⁶ N
- 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
- 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
- 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
- 8. Create 3 test questions similar to the questions above.
- 9. Solve the 3 test questions you created.

Station 4- Coulomb's Law Mixed Practice

$$F = k \frac{q_1 q_2}{d^2}$$

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 the force be if one charge were doubled? F=2.73 x10¹⁰N

d. What would the force be if the distance doubled? F=3.4 x10⁹N

- 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 the force be if one charge were doubled? F=-2.73 x10¹⁰N
 - d. What would the force be if the distance doubled? F=-3.4 x10⁹N
- 3. A charge of -4.0×10^6 C and a second charge of 4.0×10^6 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 the force be if one charge were halved? F=-1.55 x10²⁴N
- d. What would the force be if the distance was one third? F=-2.79 x10²⁵N
- 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 the force be if both charges were tripled? F=2.54 x10⁻⁴N
- d. What would the force be if the distance was halved? F=1.13 x10⁻⁴N
- 5. Create your own test question similar to the ones above and solve it.