9 | Force Fields | Review

Name _____ Period _____

1. When the charge on the objects increase, the electrical force between the objects:

   Increases   Decrease   Remains the same

2. When the distance between the objects increases, the electrical force between the objects:

   Increases   Decrease   Remains the same

3. What does it mean if the electrostatic force comes out to be positive? Negative?

+F	
-F	

4. Two oppositely charged objects are separated by a small distance, d. The objects are then moved two times farther apart from each other. Which of the following statements best describes what happens to the electrical force between the objects?
   a. The force of attraction doubles.
   b. The force of attraction is a half of its original force.
   c. The force of attraction is a fourth of its original force.
   d. The force of attraction is four times as great.

5. Draw the electric field around a negatively charged conducting sphere

6. A +5 µC point charge is placed 20 cm from a -10 µC point charge. What is the force between these two charges?

7. If Johnny (75 kg) was standing 2 meters away from a 5,000 kg elephant, what would the force of the gravitational attraction be between him and the elephant?

8. A sphere of mass 0.01 kg and charge 0.2 μC is placed at a point in an electric field where the field strength is 0.5 N C^{-1}.
   a. What force will the sphere experience?

   b. If not other forces act, what is the acceleration of the sphere?

9. What is the gravitational field (g) on the surface of the moon if the moon has a mass of 7.35 × 10^{22} kg and a radius of 1,737 km?

10. The gravitational field strength at the surface of Earth is g. What is the gravitational field strength at the surface of a planet of twice the mass and twice the radius of the Earth?
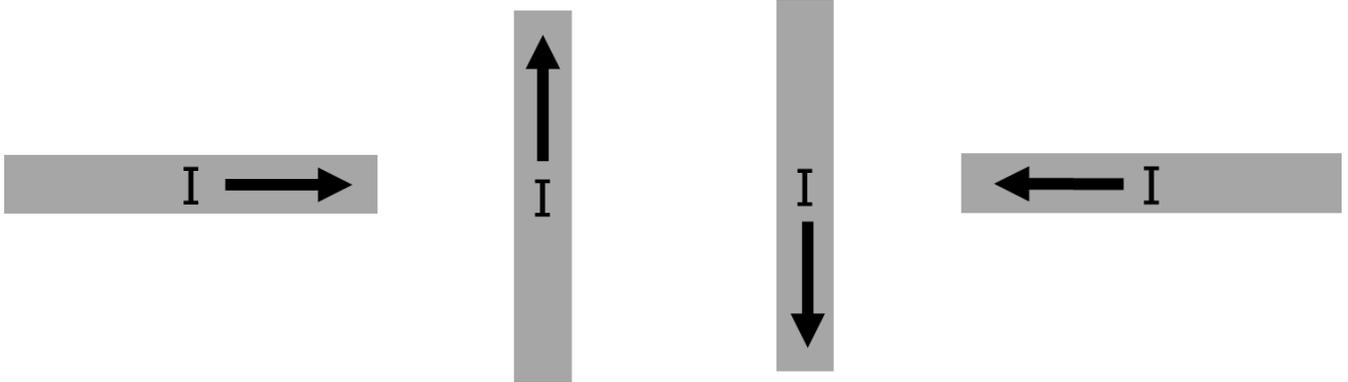
11. What is the total Electrostatic Force experienced by the -3 × 10^{-6} C charge (q_2) and what direction will it move?
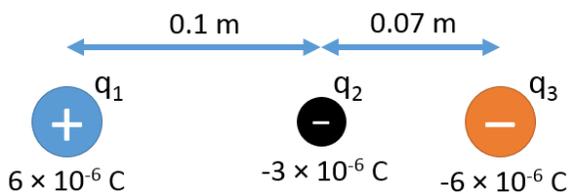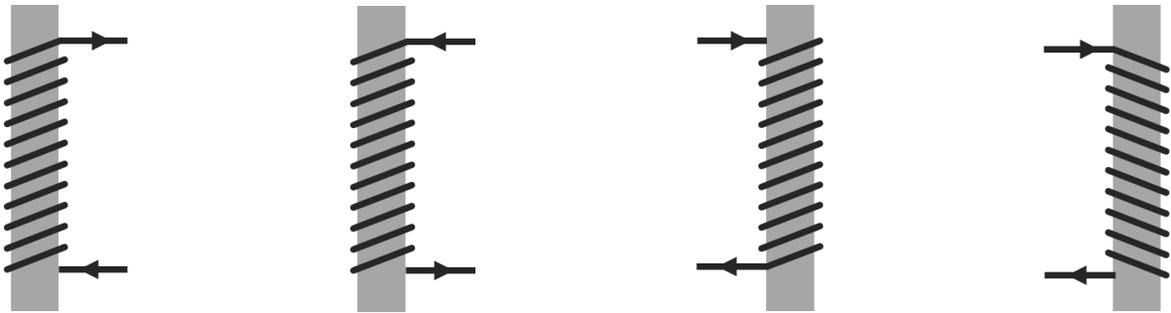

12. Describe the similarities and differences between electrostatic force and gravitational force:
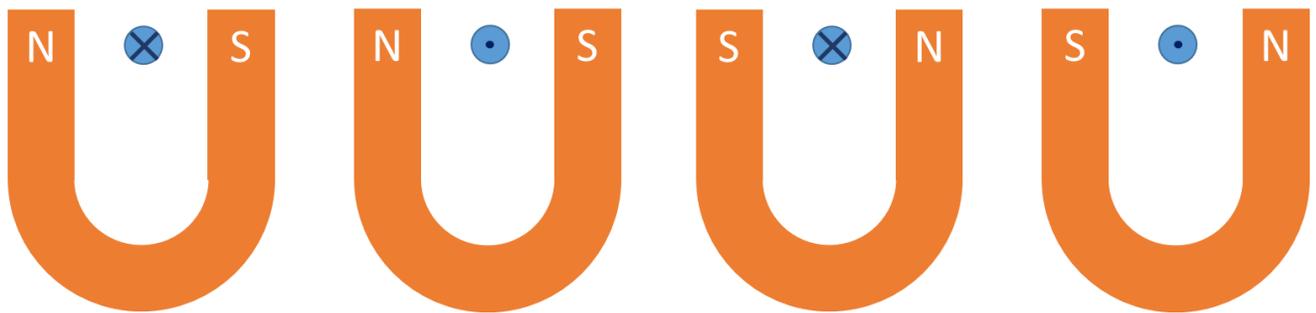
Electrostatic Force	Gravitational Force

13. Draw in the magnetic field surrounding these current carrying wires:

I →

I (up arrow)

I (down arrow)

← I

14. Label the North and South poles of the electromagnets shown below

15. Draw in the resulting force on the current carrying wire shown in the diagrams below

N ⊗ S   N ⊙ S   S ⊗ N   S ⊙ N

16. Draw in the B-Field lines showing the direction of the magnetic field in the diagram below:

I ←   ⊙

F

17. Calculate the force experienced by a negatively charged electron travelling through a B field of flux density 5 mT with a velocity of 500m s^{-1}. Draw in the path that the particle will take in the diagram below:
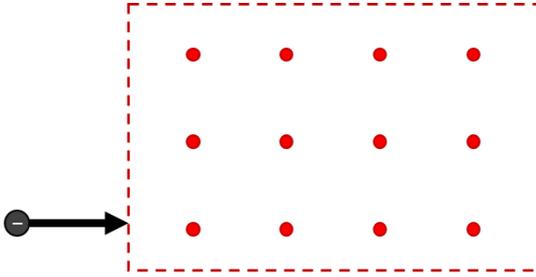
18. Calculate the force of a 40 cm wire carrying 2 A of current as it flows perpendicularly through a magnetic field with a flux of 3×10^{-2} T.

19. What would the angle relative to the magnetic field need to be for the of the wire in the last problem to experience a force of 0.012 N?