Coulomb's Law Classwork   Name:_____

1. A glass rod is charged to +5.0 nC by rubbing.
    a. Have electrons been removed from the rod or protons added? Explain.

    b. How many electrons have been removed or protons added?

2. A plastic rod is charged to -20.0 nC by rubbing.
    a. Have electrons been added from the rod or protons removed? Explain.

    b. How many electrons have been added or protons removed?

3. A plastic rod that has been charged to -15.0 nC touches a metal sphere. Afterward, the rod's charge is -10.0 nC.
    a. What kind of charged particle was transferred between the rod and the sphere, and in which direction? That is, did it move from the rod to the sphere or from the sphere to the rod?

    b. How many charged particles were transferred?

4. Two identical metal spheres A and B are connected by a metal rod. Both are initially neutral. 1.0×10^{12} electrons are added to sphere A, then the connecting rod is removed. Afterward, what is the charge of A and the charge of B?

5. Two 1.0 kg masses are 1.0 m apart on a frictionless table. Each has a +1.0 µC of charge.
     a. What is the magnitude of the electric force on one of the masses?

     b. What is the initial acceleration of each mass if they are released and allowed to move?

6. Two small plastic spheres each have a mass of 2.0 g and a charge of -50.0 nC. They are placed 2.0 cm apart.
     a. What is the magnitude of the electric force between the spheres?

     b. By what factor is the electric force on a sphere larger than its weight?

7. A small plastic sphere with a charge of -5.0 nC is near another small plastic sphere with a charge of -12 nC. If the spheres repel one another with a force of magnitude 8.2×10^{-4} N, what is the distance between the spheres?

8. A small glass bead has been charged to +20.0 nC. A tiny ball bearing 1.0 cm above the bead feels a 0.018 N downward electric force. What is the charge on the ball bearing?