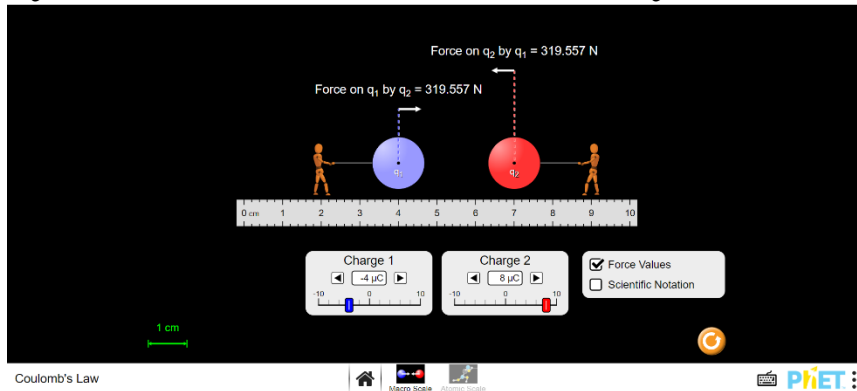


# What are the two factors that influence the strength of electrostatic force between charged particles?

Figure 1: Initial PhET Simulation screen – default settings



Step 1: Familiarize yourself with the simulation. Play around with the settings and make observations. When you're finished playing around, hit the orange reset button.

Step 2: Set Charge 1 to  $-8 \mu\text{C}$  and Charge 2 to  $+8 \mu\text{C}$ . What do you observe about the electrostatic force between the charged particles? What does the direction of the arrows

indicate about the electrostatic force?

Step 3: Set Charge 1 to  $+8 \mu\text{C}$ . What do you observe about the electrostatic force between the charged particles? What does the direction of the arrows indicate about the electrostatic force?

Step 4: Set Charge 1 to  $0 \mu\text{C}$ . What happened to the electrostatic force between the charged particles? What can you conclude as a result of this change?

Step 5: Increase the magnitude of Charge 1 (in the negative direction) by one  $\mu\text{C}$  at a time. Stop when you've reached  $-10 \mu\text{C}$ . What did you notice about the amount of electrostatic force between the charged particles each time you increased Charge 1? What can you conclude about how the amount of charge is related to the amount of electrostatic force?

Step 6: Set Charge 1 to  $0 \mu\text{C}$ . Increase the magnitude of Charge 1 (in the positive direction) by one  $\mu\text{C}$  at a time. Stop when you've reached  $+10 \mu\text{C}$ . What did you notice about the amount of electrostatic force between the charged particles each time you increased Charge 1? What can you conclude about how the amount of charge is related to the amount of electrostatic force?

Step 7: Set Charge 1 to  $-8 \mu\text{C}$  and Charge 2 to  $+8 \mu\text{C}$ . Move Charge 1 closer to Charge 2 one centimeter at a time. Observe the amount of electrostatic force between the charged particles. What did you notice about the amount of electrostatic force between the charged particles each time you decreased the distance between the particles? What can you conclude about how the distance between the particles is related to the amount of electrostatic force?

Step 8: Move Charge 1 farther from Charge 2 one centimeter at a time. Observe the amount of electrostatic force between the charged particles. What did you notice about the amount of electrostatic force between the charged particles each time you increased the distance between the particles? What can you conclude about how the distance between the particles is related to the amount of electrostatic force?