

Name:  
Date:

Section:  
Teacher:

Number:  
Period:

### Regents Physics Lab #27: Electric field lines

**Objective:** Investigating conventions used in drawing electric field lines for point charges.

**Instructions:**

Click this link: <https://academo.org/demos/electric-field-line-simulator/>

The grey lines represent the electric field lines around the charges. Note that the Electric field lines have arrow heads. The electric field therefore has direction along with magnitude.

Fill in each blank:

(1) Quantities that have direction along with magnitude are known as \_\_\_\_\_.

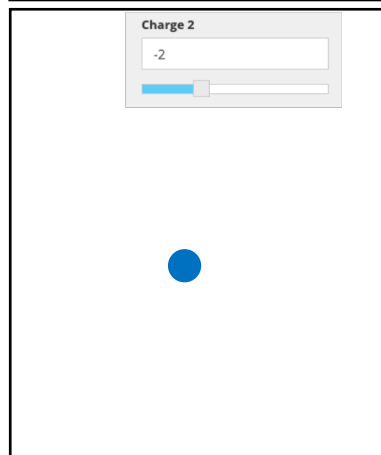
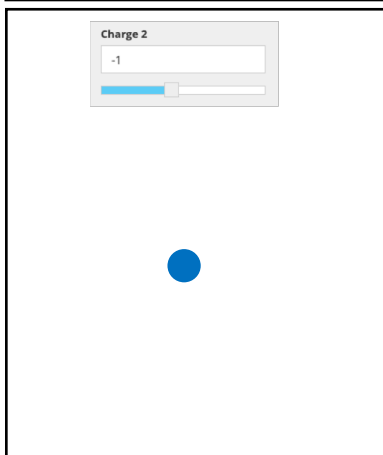
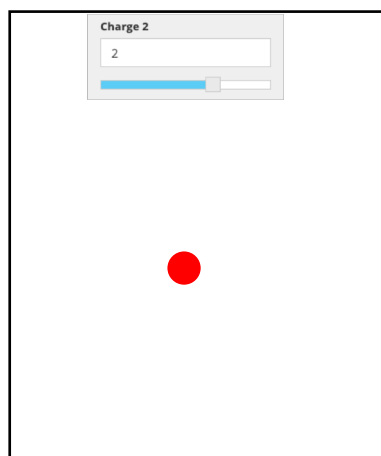
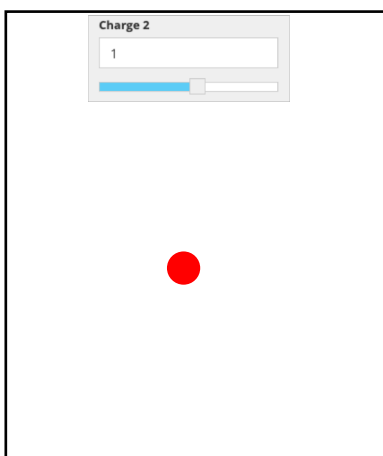
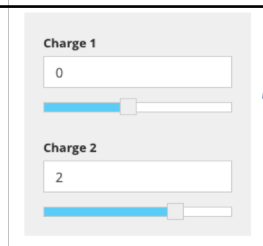
Using the sliders on the right side of the simulation, as appropriate, answer the following:

- (2) Electric field line arrows always point \_\_\_\_\_ a positive charge.
- (3) Electric field line arrows always point \_\_\_\_\_ a negative charge.

Set Charge 1 to zero in the simulation.

Accurately draw the field lines around Charge 2 for each of the four slider settings shown below

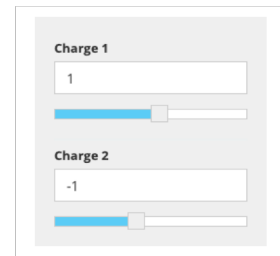
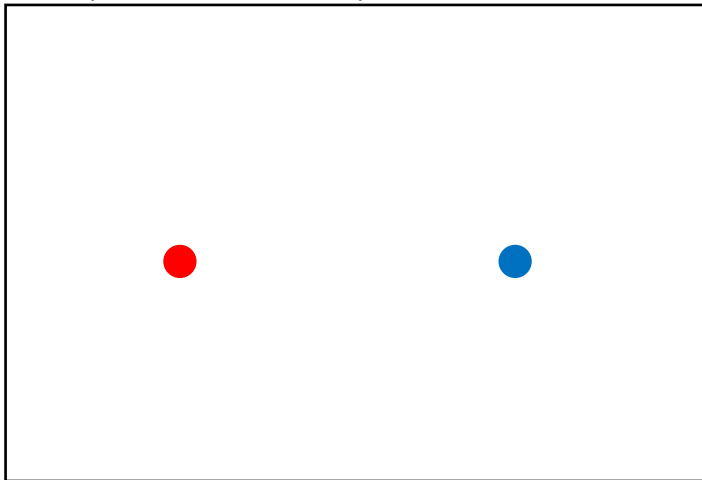
On the right you'll see two sliders that allow you to adjust the values of the point charges. Although not shown in the simulation, the unit on electric charge is the Coulomb.



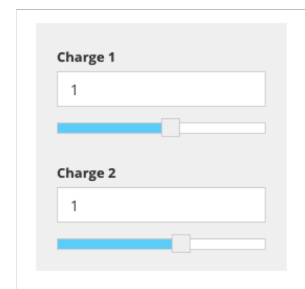
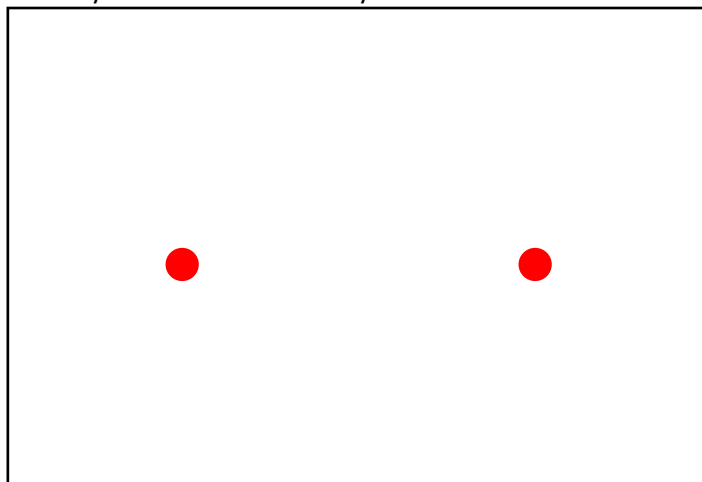
(4) As seen above, as we increase the magnitude of the charge, we \_\_\_\_\_ the number of field lines around that charge.

(5) When Charge 2 is set to +1 Coulomb, we see 9 field lines coming from it. Therefore, without counting, when Charge 2 is set to +5 Coulombs there would be \_\_\_\_\_ field lines surrounding it.

(6) Adjust the sliders to the settings shown here  
 Accurately draw the E field lines you observe.



(7) Adjust the sliders to the settings shown here  
 Accurately draw the E field lines you observe.



(8) Using this image answer the following.

- a. Charge \_\_\_\_\_ is negative and charge \_\_\_\_\_ is positive.
- b. If charge X has a magnitude of  $5 \times 10^{-9}$  C, charge Y must have a charge of magnitude \_\_\_\_\_ C.

