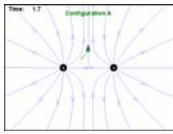
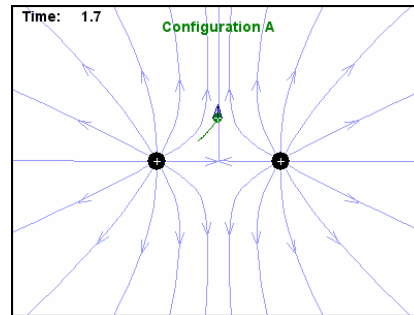
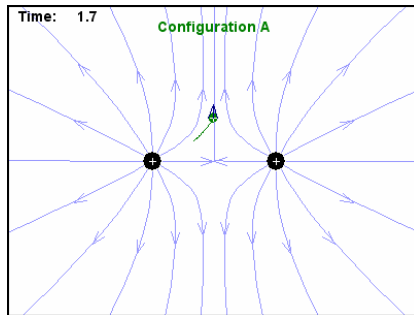


## Worksheet for Exploration 23.2: Field Lines and Trajectories

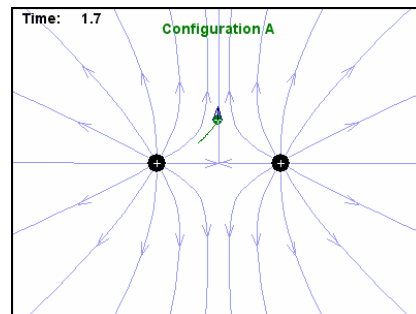
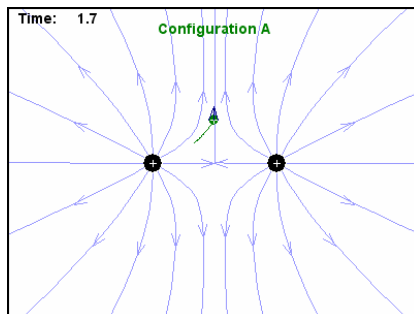


The animation shows two fixed charges and a test charge (**position is given in meters and time is given in seconds**). The electric field lines due to the fixed charges and the force vector on the test charge are shown. The test charge will move under the action of the electric field when the animation is played.

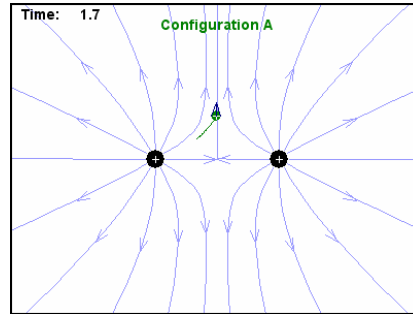
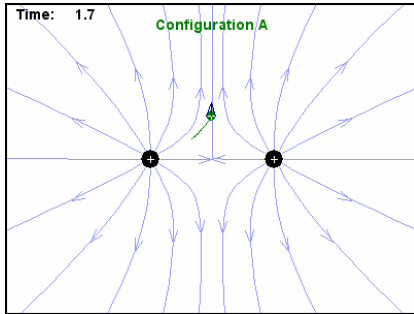
- a. Using Configuration A, drag the test charge to the approximate position of  $(-0.8 \text{ m}, 0 \text{ m})$ . Write down a prediction for the path the charge will follow after being released at this point. **After** you have made your prediction, play the animation. Was your prediction correct? If not, what caused your error?
  - i. Sketch your prediction and then the experiment on the figures to the left then right respectively.



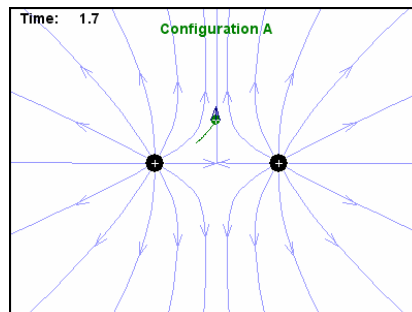
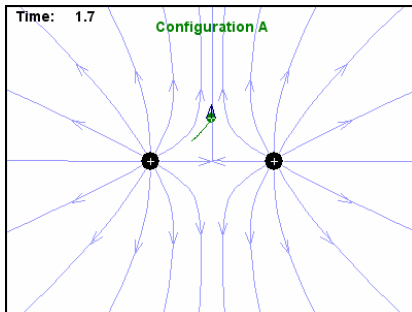
- b. Reset the applet and then drag the test charge to the approximate position of  $(1 \text{ m}, 0.35 \text{ m})$ . As before, write down a prediction for the path the charge will follow after being released. If your prediction was incorrect, explain the flaw in your reasoning.
  - i. Again sketch below.



c. Repeat using Configuration B with the charge being released from the point  $(-0.5 \text{ m}, 0.5 \text{ m})$ .



d. Repeat using Configuration B with the charge being released from the point  $(0 \text{ m}, 1.3 \text{ m})$ .



e. You should be able to discuss why the trajectories of the charges do not follow the electric field lines in general.