

Phys 221 Lab

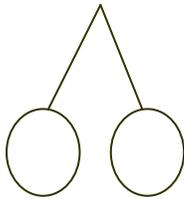
Electric Field Hockey

Play with the PhET simulation "Electric Field Hockey"

Learning Goals: Students will be able to

- Determine the variables that affect how charged bodies interact
- Predict how charged bodies will interact
- Describe the strength and direction of the electric field around a charged body.
- Use free-body diagrams and vector addition to help explain the interactions.

1. Say you rub balloons in your hair and then hang them like in the picture below. Explain why you think they move apart and what might affect how far apart they get.



Experiment

2. Test your ideas using *Electric Field Hockey*. Make a table to record your observations about what affects the direction and speed of the puck. Your table should demonstrate that you have run controlled tests with all the variables.
3. Reflect on your ideas from question #1 and your data from question #2. How do your observations support, dispute or add to your ideas about what affects how charged bodies interact?

Investigate

- What do you think the arrows on the puck are illustrating?
- How do the arrows from the positive charges compare and contrast to the ones from the negative charges?
- How do the arrows change if you switch the puck charge to negative?
- Do the electric field lines show the exact path of the puck?
- Describe what the electric field lines show in your own words. Does this relate to the bowling ball/ croquet mallet lab from last fall?

Explanation

Write an explanation of how you can predict the motion of a charged hockey puck that is moved by other charged pucks. Explain using examples and drawings that include:

- How to use free body diagrams and vector addition.
- How negative and positive charges compare and contrast.
- Use at least three terms presented in Chapter 20 of your text

Challenge

Pick any level you'd like and have a contest. Who can get the puck in the goal with the least number of charges? (you can cheat and look on youtube for ideas)

Post your best players score on the board.