AP PHYSICS C LAB: ELECTRIC FIELDS

NAME:_____

1. Type your name at the top of this document and then Save this file on your U: drive or on a flash drive so you can access it again if you don't finish today.
2. Minimize this window and go back to my website homepage page and click on the Link named "Physics Simulations." If that doesn't work type in this web address: http://www.colorado.edu/physics/phet/web-pages/index.html

eLab 1, part A

1. Click on the category named *Electricity, Magnets, & Circuits*, then find *Charges and Fields*, click on it, then select *Run Now!*.
2. Select Grid and Show Numbers in the green menu box. Place equal and opposite charges exactly 2 meters apart.
3. Now place 3 E-field sensors on the grid; A) one exactly between the 2 charges, B) another 1 m above the first, and C) a 3rd anywhere on the grid that produces a net field vector at 45 degrees.
4. Use the Print Screen key to take a picture of your set up.
   [paste your image here, resize if necessary]
5. (Do this part at home.) For each position A, B, and C, show calculations of the net E-field vector (size and direction) that closely matches the computer results. (Note: The units shown are V/m; don't worry because 1 V/m is the same as 1 N/C.) You can show your work directly on the diagram or attach a separate sheet.

eLab 1, part B

6. Clear the field. Then create a 1 meter long line of 11 charges.
7. Place 2 E-field sensors; A) one at point 1 m away from one end along the line of charge, and B) one at a point 1m away from the center along the bi-sector.
8. Use the Print Screen key to take a picture of your set up.
   [paste your image here, resize if necessary]
9. (Do this part at home.) For each position A, and B, use calculus to derive a general equation for the E-field from a line of charge L units long. Then plug in the numbers to show that your equation closely matches the computer results.

eLab 2 (Field Hockey)

1. Click on the category named *Electricity, Magnets, & Circuits*, then find *Electric Field Hockey*, click on it, then select *Run Now!*.
2. Start with difficulty level 1. Place up to 10 + charges and 10 – charges in strategic locations to help push/pull the hockey puck into the goal. When you get it, make sure the trace is showing, then use Print Screen to take a picture of your solution.

   [paste your image here, resize if necessary]

3. Repeat for difficulty level 2.

Level 3 is extra credit.

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