**Computer Simulation: Drawing Electric Field Lines and Electric Field Intensities**

*Go to* <http://phet.colorado.edu/en/simulation/charges-and-fields> *and select the Charges and Fields Simulation. You will use this simulation to help you draw electric field lines for different scenarios.*

*Take a minute and familiarize yourself with the tools on the right hand side*.



1. Electric field lines of a single source charge

*Draw the electric field lines around one (1) positive charge and one (1) negative charge separately. Be sure to include directions of electric field, charge, and proper notations.*

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| **Positive Charge** | **Negative Charge** |
|  |  |

1. Electric field intensity per charge
2. *Draw the electric field lines for four (4) positive source charges and four (4) negative source charges*

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| *ELECTRIC FIELD AROUND POSITIVE CHARGES* |
| **+1 nC** | **+3 nC** | **+7 nC** | **+10 nC** |
|  |  |  |  |

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| *ELECTRIC FIELD AROUND NEGATIVE CHARGES* |
| **-1 nC** | **-3 nC** | **-7 nC** | **-10 nC** |
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1. *Describe, in your own words, how the electric field intensity changes for each charge*

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1. *Fill in the following statement*

As the electric field \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the magnitude of the charge \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Drawing electric field lines for polar and non-polar charges
2. *Draw the electric field lines, for three cases of increasing intensity, around a positive and negative charge. Include the charge, electric field lines (including directions), and proper notations.*

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| *ELECTRIC FIELD LINES AROUND A POSITIVE AND A NEGATIVE CHARGE* |
| **First intensity** | **Second intensity** | **Third intensity** |
|  |  |  |

1. *Draw the electric field lines, for three cases of increasing intensity, around two positive charges. Include the charge, electric field lines (including directions), and proper notations.*

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| *ELECTRIC FIELD LINES AROUND A TWO POSITIVE CHARGES* |
| **First intensity** | **Second intensity** | **Third intensity** |
|  |  |  |

1. *Draw the electric field lines, for three cases of increasing intensity, around two negative charges. Include the charge, electric field lines (including directions), and proper notations.*

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| *ELECTRIC FIELD LINES AROUND A TWO NEGATIVE CHARGES* |
| **First intensity** | **Second intensity** | **Third intensity** |
|  |  |  |



1. *Describe the nature of the electrostatic force surrounding the charges for each scenario above. Include in your discussion how the electrostatic force changes from each intensity and if/where there are any points of interest in the electric field worth mentioning.*

*(Hint: Use the electric field sensors and the equipotential voltage meter in your electric field)*

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