

Asynchronous Activity: Potential of a Line of Charges

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1 How to Submit this Worksheet

1. Scan your responses into a PDF using a Smartphone app, or simply a photo. One example app is SimpleScanner. Websites also exist to convert jpg to PDF format (e.g. <https://smallpdf.com/jpg-to-pdf>).
2. Upload your worksheet PDF to Moodle via the submission link.

2 The Procedure

- Use the PhET Charges and Fields tool to create a line of positive charges parallel to a line of negative charges, as shown in class.
- Using the blue voltage measurement tool, and the yellow distance measuring tool, record the voltage as a function of distance between the parallel lines of positive and negative charge.
- Take 10-15 measurements at regular intervals.
- Graph the data, and label the axes with the right units.
- Use the trend line feature of the plotted data set to add a *linear* fit.
- Include your graph below (you can hand draw it or copy it from the spreadsheet).
- Answer the questions below.

3 Questions

1. If $E = -\Delta V/\Delta x$, explain why the ΔV as a function of x in this system is linear.
2. Use the linear trendline to predict a voltage at a location where you did not collect a data point (*interpolation*).