




Determining R^2 Values For **Linear** data with a Continuous I.V.

An R^2 value is used to determine how “good of a fit” a linear trend-line (straight best-fit line) is to data with a continuous I.V. You should determine an R^2 value whenever you assume a trend line to a set of data on a scatter plot (ONLY when you are pretty sure that there is a linear correlation to your data – talk to you mentor or your teacher if you are unclear on this).

To determine an R^2 value, first you must create a scatter plot of your data in Excel.

- Open excel and type your data into a new spreadsheet:
 - I.V. in the first column (with a label in the top box)
 - D.V(s) In the second (and subsequent) column(s)
 - DO NOT put units on your numbers
 - DO NOT type fractions. For Dates, Times, money, or any other special numbering systems, highlight the column you are typing in and choose **CELLS** from the **FORMAT** menu. Choose the **NUMBER** tab in the cells dialog, and choose the type of numbering system you want to use from the category list. Click **OK**.
- When all data is entered, highlight all of your data and choose the **GRAPH TOOL**  from the toolbar (or choose chart from the insert menu).
- Choose **XY SCATTER** from the chart menu:  XY (Scatter)
- Choose the XY sub-type with **NO LINES**: 
- You can now choose the **PRESS AND HOLD TO VIEW SAMPLE** the button on the bottom of the dialog. If you are satisfied with the graph you see, choose the **NEXT** button from the bottom of the dialog box.
- You should now see a graph of your data with the words data range: and series in: below it. Simply click **NEXT** at this screen.
- You will now be asked to enter the title and labels for your graph:
 - **TITLE:** D.V. versus I.V. *Example: Plant Height Vs. Time*
 - **VALUE (X) AXIS:** I.V. *Example: Time (Day From Planting)*
 - **VALUE (Y) AXIS:** D.V. *Example: Height (cm.)*
- If you only have one D.V., choose the **LEGEND** tab from the top of the screen and **uncheck** the **SHOW LEGEND BOX**.
- When finished click **FINISH**. You will be presented with a choice of where to put your graph. Choose **AS NEW SHEET** and click **FINISH**.

Now lets make a trend line if one belongs

• Look at the data on your graph and determine whether the data shows a linear correlation. Only you can do this part, the computer cannot decide for you. Even if it looks linear, that doesn't mean that a linear correlation makes SENSE for your data....YOU MUST THINK ABOUT WHAT A LINEAR CORRELATION MEANS REGARDING YOUR VARIABLES.

- If no correlation is evident - Your conclusion must state that there is NO CORRELATION between your I.V. and your D.V.
 - If you believe that some NON-LINEAR correlation is present (exponential, logarithmic, etc... see your mentor or teacher for more help.
 - If you believe a LINEAR correlation to be present, choose **ADD TRENDLINE** from the **CHART** menu.
 - Choose the trend you believe to be present (most often this will be linear).
 - Choose the **OPTIONS** tab from the top of the box and check the **DISPLAY R² VALUE ON CHART** option. Click **OK**
- Most scientists like to see an R² value of .95 or higher (95% confidence that the line fits the data), but you can argue a lower fit if you feel that you can justify such a decision at the fair.

