Physics 12
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Graphing with Excel

1. Enter your **data** into columns.
   - To avoid needing to swap the axes later, the independent variable should be on the left of the dependent variable.

2. Insert a **scatter plot**.
   1. Highlight the data that you want to plot.
      - If the columns are not next to each other, highlight one column, then hold down the control key and highlight the other column.
   2. Insert > Chart > X Y (Scatter)
   3. The independent variable should be on the horizontal axis. To swap the axes, right click the graph and click 'Select Data…', then exchange the contents of 'X values' and 'Y values' in the subsequent menu (Figure 2).

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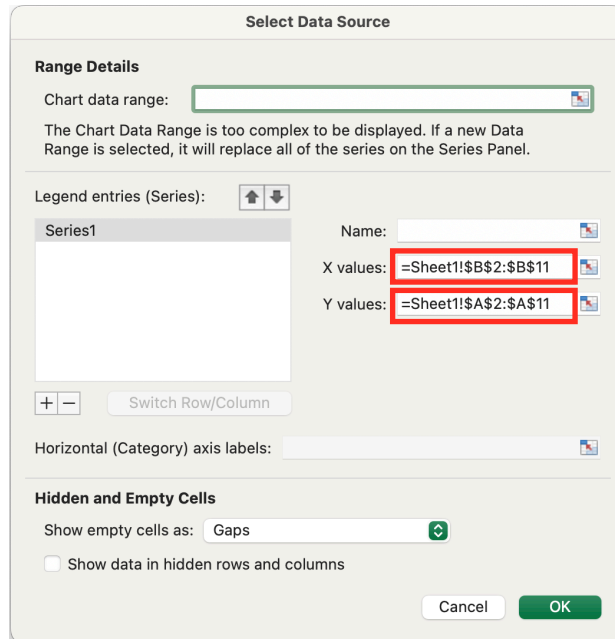
Figure 2: If the axes need to be swapped, open the 'Select Data…' window and exchange the contents in 'X values' and 'Y values'.

3. Add **axis labels**.
   1. Click on the graph.
   2. Chart Design > Add Chart Element > Axis Titles > Primary Horizontal/Vertical
   3. Click on the each default axis title and name them appropriately with units in bracket.
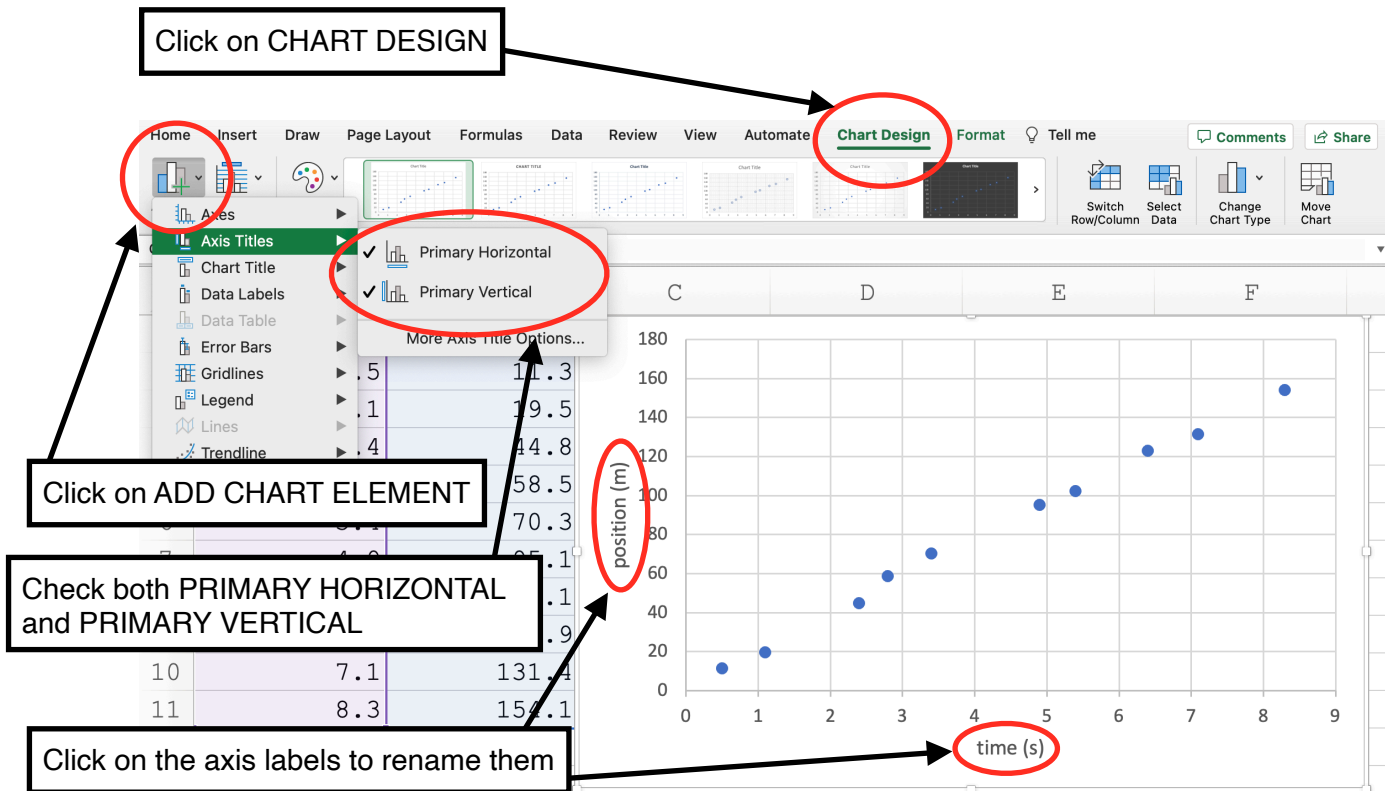

Click on CHART DESIGN

Click on ADD CHART ELEMENT

Check both PRIMARY HORIZONTAL and PRIMARY VERTICAL

Click on the axis labels to rename them

Figure 3: From the 'Insert Chart Element' dropdown menu, axis labels are added. Units are included in brackets after the label.

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4. Add a **trendline**.
    1. Click on the graph.
    2. Chart Design > Add Chart Element > Trendline > More Trendline Options…
    3. Select the appropriate function (usually Linear)
    4. Check "Display Equation on chart"
    5. If appropriate, the trendline can be extended beyond the data points using "Forecast".
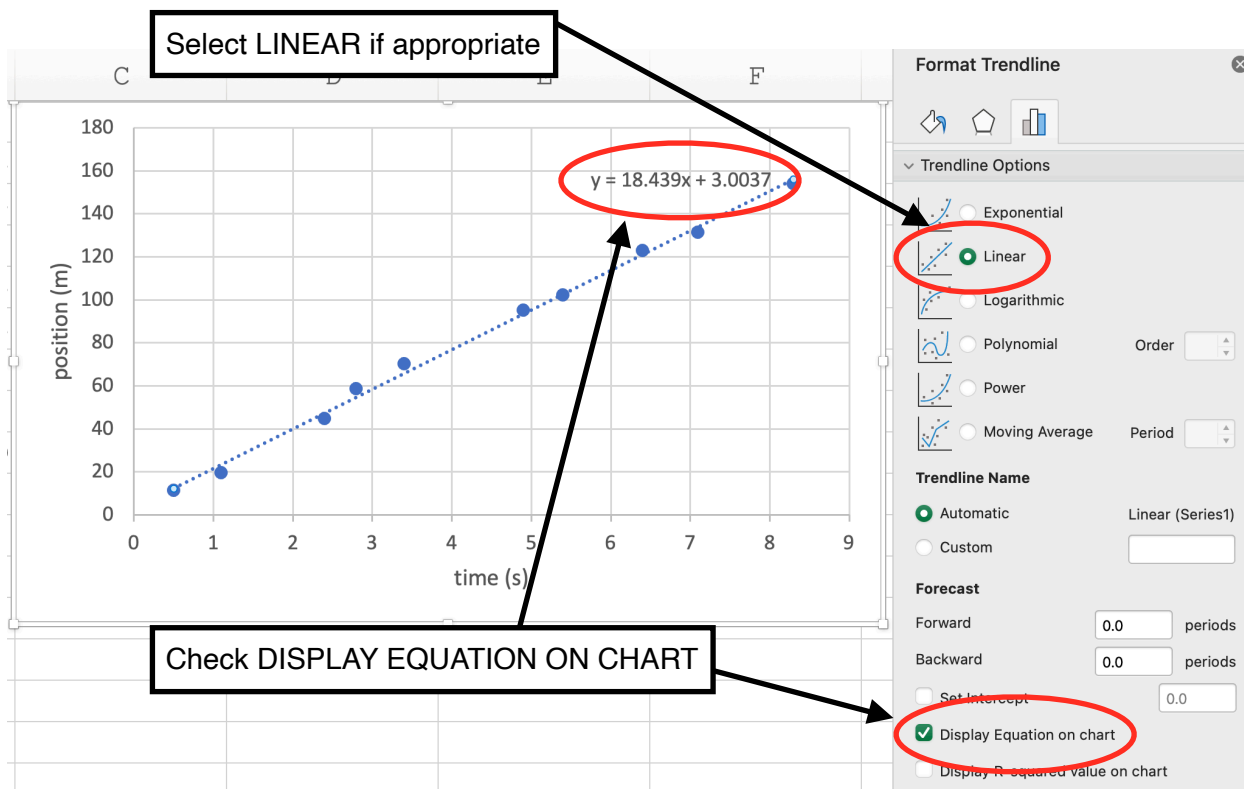

Figure 4: A linear trendline is added. The equation is displayed on the graph

5. Continue formatting as needed.
    - If plotting only one set of data on the graph, no **legend** is needed. A legend should be included any time two or more sets of data are plotted on the same graph.
    - If a caption will be included, no **chart title** is needed.
    - The **axes** can be formatted by double-clicking the axis. You can change the range and the scale.
    - The **data points** can be formatted by double-clicking a data point. You can change the marker type, colour and size.
    - If uncertainty is included with your data, **error bars** can be added.
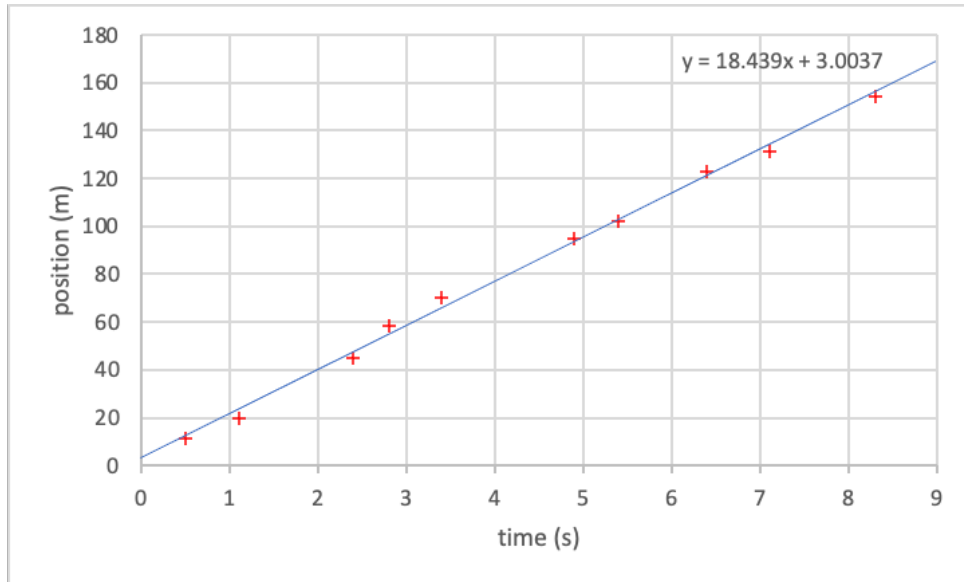
Figure 5: The final graph after additional formatting. The complete graph includes axis labels, an appropriate scale and the best fit line with its equation. The slope of the line can be determined from the equation: 18.4 m/s.