Physics 12 M. Lam

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).

| Home | Insert Draw Page | Layout Formulas Data | Review View Auto | mate Developer |
|-------------|------------------------------------|-----------------------------|---|--|
| Tayles | From Picture Illustrations | Checkbox Recommended Charts | x · · · · · · · · · · · · · · · · · · · | Chart Sparklines Timeline Link New Tex |
| A2 | $$ \times \checkmark f_x 0.5 | | | |
| Click on IN | SERT A | В | · · · · · | |
| 1 | time (s) | position (m) | · · · · | |
| 2 | 0.5 | 11.3 | Scatter Bubble | |
| 3 | 1.1 | 19.5 | | |
| 4 | 2.4 | 44.8 | | |
| 5 | 2.8 | 58.5 | | Choose SCATTER |
| 6 | 3.4 | 70.3 | | |
| 7 | 4.9 | 95.1 | | |
| 8 | 5.4 | 102.1 | | |
| 9 | 6.4 | 122.9 | | |
| 10 | 7.1 | 131.4 | | |
| 11 | 8.3 | 154.1 | | |

| Select Data Source | | | | | | |
|--|----------------------------------|--|--|--|--|--|
| Range Details Chart data range: The Chart Data Range is too complex to be displayed. If a new Data Range is selected, it will replace all of the series on the Series Panel. | | | | | | |
| Legend entries (Series): | | | | | | |
| Series1 | Name: 💽 | | | | | |
| | X values: =Sheet1!\$B\$2:\$B\$11 | | | | | |
| | Y values: =Sheet1!\$A\$2:\$A\$11 | | | | | |
| + - Switch Row/Column | | | | | | |
| Horizontal (Category) axis labels: | N | | | | | |
| Hidden and Empty Cells Show empty cells as: Gaps © Show data in hidden rows and columns Cancel OK | | | | | | |

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.



Figure 3: From the 'Insert Chart Element' dropdown menu, axis labels are added. Units are included in brackets after the label. © 2023–2024 Mark Lam mrlamphysics.com

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.