

CHAPTER 14 CHARTING TECHNIQUES

INFOCUS

When you create a chart in Excel, it's produced with a default layout and appearance. You can modify the layout, by adding labels and other features, to improve its appearance and readability.

In this session you will:

- ✓ gain an understanding of chart layout elements
- ✓ learn how to add a chart title
- ✓ learn how to add axes titles
- ✓ learn how to position the legend
- ✓ learn how to show data labels
- ✓ learn how to show a data table
- ✓ learn how to modify the horizontal and vertical axes
- ✓ learn how to show or hide gridlines
- ✓ learn how to format the plot area
- ✓ learn how to add a trendline
- ✓ learn how to add error bars to a chart
- ✓ learn how to add a text box to a chart
- ✓ learn how to draw shapes in a chart.

UNDERSTANDING CHART LAYOUT ELEMENTS

Microsoft Excel provides a range of chart elements that can be added to the layout or used to modify the layout so that the chart is easier to interpret. Charts can be used to communicate a

range of ideas, and **chart layout elements** help you emphasise particular ideas, information and trends. This page takes an introductory look at the elements that you can take advantage of.

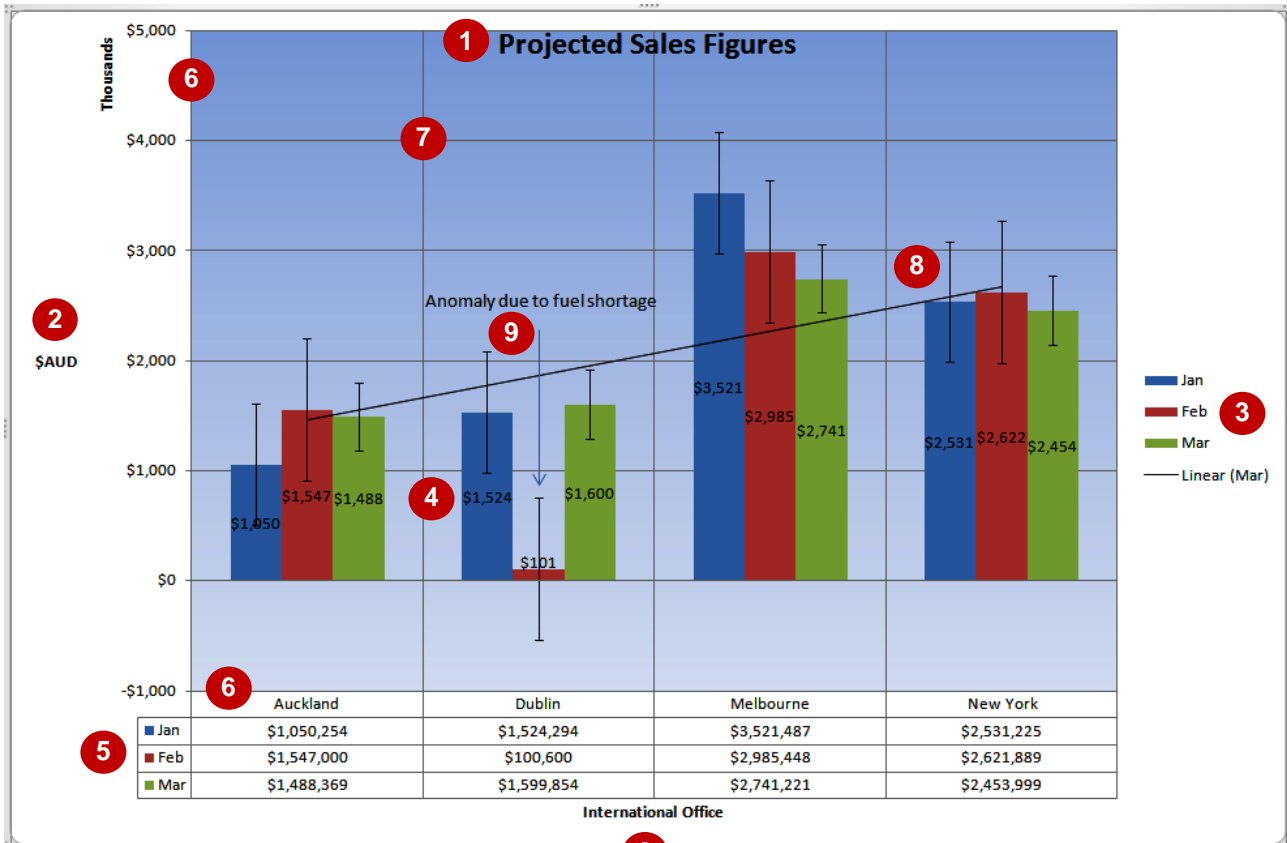


Chart Layout Elements

The chart above has been overlaid with chart layout elements so that you can see how they fit in and work together. In reality, you would only ever use a few at a time to avoid confusion.

- 1** The **chart title** appears at the top of the chart and explains its purpose. Textual elements like this can be edited and moved to any location required.
- 6** The **horizontal (x)** and **vertical (y) axes** show the scale of the chart or nominate the data elements. In this example, the x-axis is hidden by the data table.
- 2** The **axes titles** give an overview of the data that is plotted on the chart.
- 7** **Horizontal** and **vertical gridlines** can be drawn across the **plot area** (background) to help the reader judge the position of the elements, e.g. the size of the column.
- 3** The **legend** tells you the name of each data series in the chart.
- 8** A **trendline** shows you the trend of a particular data series, while **error bars** show you possible variations in figures.
- 4** The **data labels** show you the actual figures in conjunction with the data points.
- 9** **Text boxes** and **shapes** (e.g. arrows) can be used to annotate charts or provide additional information.
- 5** A **data table** details the chart figures below the data points in a table layout. In this example it includes the **legend key**.

ADDING A CHART TITLE

The **chart title** tells the reader at a glance what the chart is about. It is effectively a summary of the purpose of the chart. Chart titles generally appear at the top of the chart where they don't

interfere with the plotted figures in the chart. Excel provides two pre-set title positions – one **above** the chart and one **overlaid** on the chart so that there is more room for the plot area.

Try This Yourself:


Open File

Before starting this exercise you MUST open the file E829 Charting Techniques_1.xlsx...

- 1 Click on the **Projected Sales Chart** worksheet tab to see the chart

This column chart shows sales projections, but without a title it's a bit hard to work this out...

- 2 Click on the chart, then click on the **Chart Tools: Layout** tab to display the layout tools

- 3 Click on **Chart Title**  in the **Labels** group to display the options

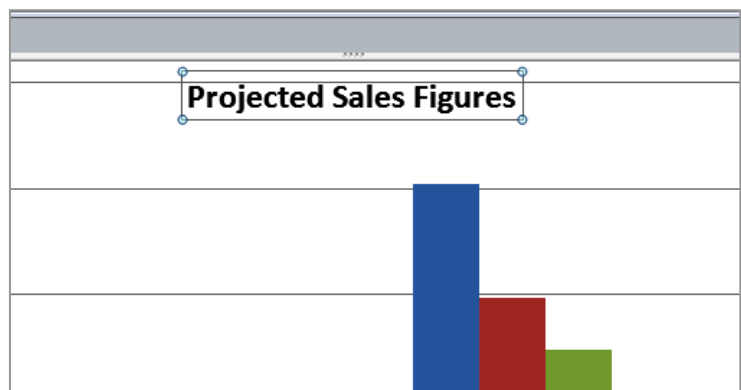
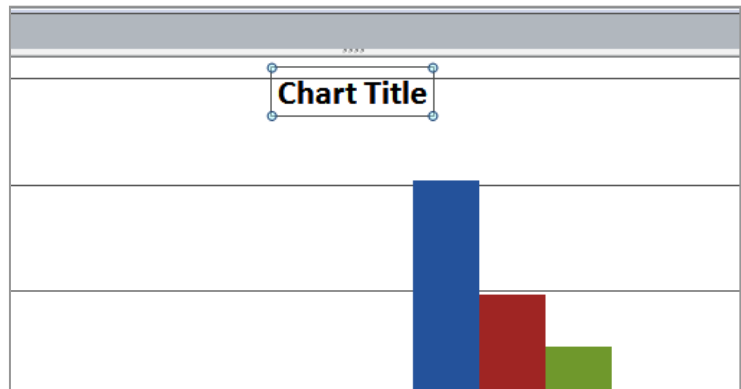
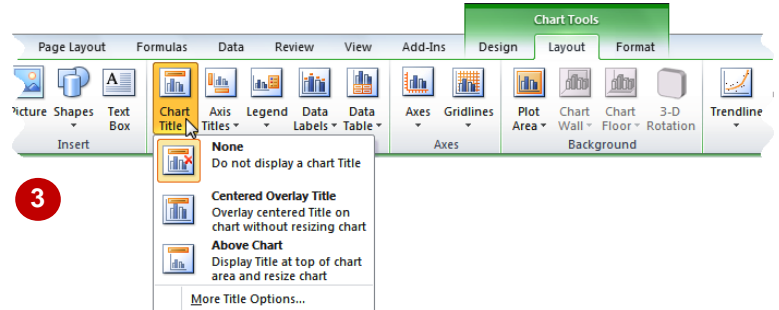
Centred Overlay Title leaves the size of the plot area unchanged while Above Chart resizes the chart and places the title outside the plot area...

- 4 Select **Centred Overlay Title**

The chart title will appear at the top of the chart over the plot area...


- 5 Type **Projected Sales Figures** then press

The text appears in the Formula bar as you type and is placed in the Title text box when you press




For Your Reference...

To **add** a **chart title**:

1. Click on **Chart Title**  in the **Labels** group on the **Chart Tools: Layout** tab
2. Select a position option
3. Type the title text and press

Handy to Know...

- You can remove a title by clicking on **Chart Title**  and selecting **None**.
- There are only two pre-set placement options, but you can drag the title to any position you like. You can also edit it by clicking in the text box and making changes.

ADDING AXES TITLES

Axes titles appear outside the **vertical** (y) axis and the **horizontal** (x) axis and are used to provide units of measure or an overall text description of the data elements plotted on each


axis. For example, if your vertical axis shows dollar amounts, you can detail which currency you've used by adding a vertical axis title.

Try This Yourself:

Same File


Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_2.xlsx...*

1 If the **Chart Tools: Layout** tab is not displayed, click in the chart and then click on the tab

2 Click on **Axis Titles** , in the **Labels** group, then point to **Primary Horizontal Axis Title**
The options are displayed...

3 Select **Title Below Axis** to place a title below the chart

4 Type **International Office** and press

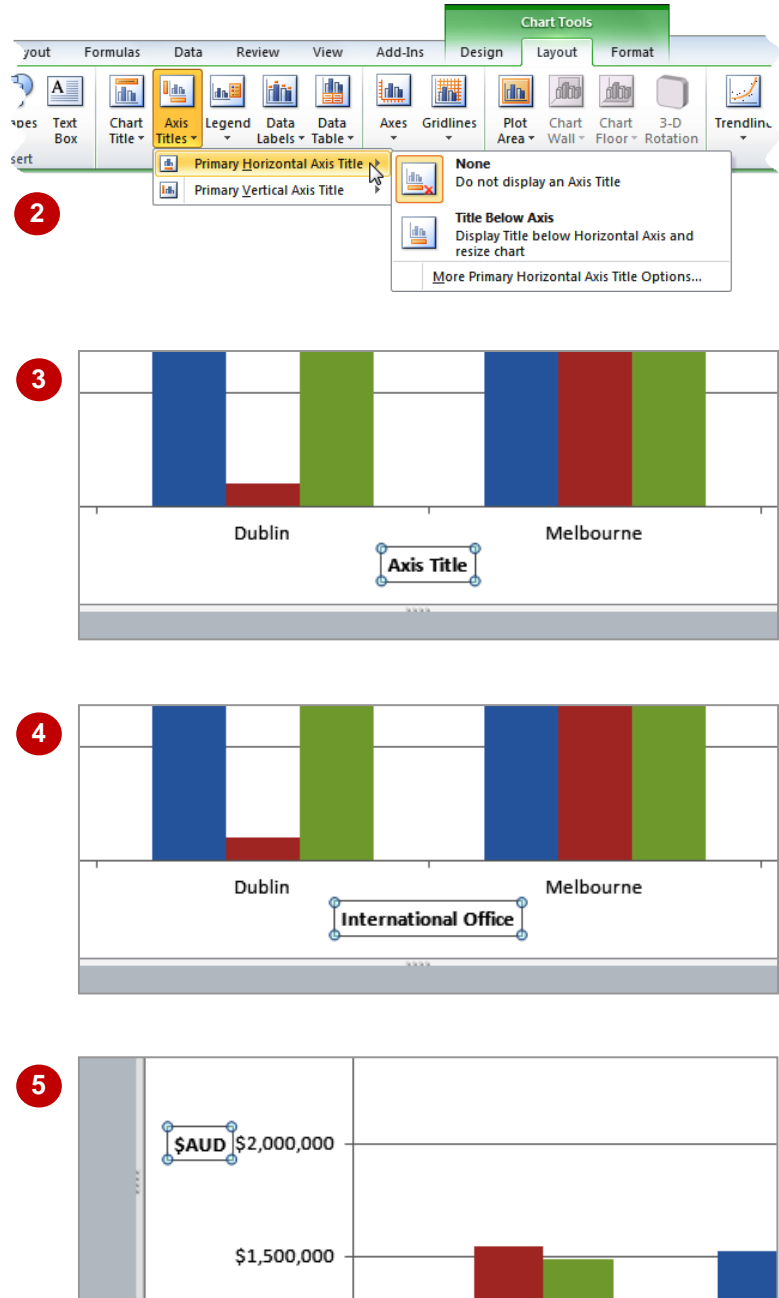
5 Click on **Axis Titles** , then point to **Primary Vertical Axis Title** to display the options

There are a few more alternatives for the vertical axis...

6 Select **Horizontal Title**

It will appear to the left of the chart and the plot area will resize to make room for it...

7 Type **\$AUD** then press



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For Your Reference...

To **add axes titles**:

1. Click on **Axis Titles** 
2. Point to **Primary Vertical Axis Title** or **Primary Horizontal Access Title**
3. Select the required option
4. Type the title text then press

Handy to Know...

- You can remove an axis title by clicking on the title and pressing or by clicking on **Axis Titles** , pointing to **Primary Vertical Axis Title** or **Primary Horizontal Access Title** and selecting **None**.

POSITIONING THE LEGEND

A **legend** is a list of the data series that have been plotted on a chart along with their corresponding colours or other identifying marks. By default, charts are created with a legend that

appears to the right of and outside the plot area. There are six pre-set position options for you to select from, some overlaying the plot area, others being placed outside the plot area.


Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_3.xlsx...*

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart and then click on the tab

Currently, the legend is positioned on the right...

2 Click on **Legend** , in the **Labels** group, to display the options

3 Select **Show Legend at Top**

The legend will move to behind the title and the plot area will widen...

4 Click on the legend so that pale blue handles appear around it

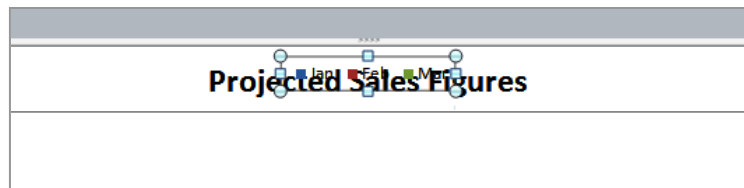
5 Point to the line anywhere between the top handles, then drag the legend down below the heading

You can actually position the legend wherever you want to. We'll put it back near the data that it explains...

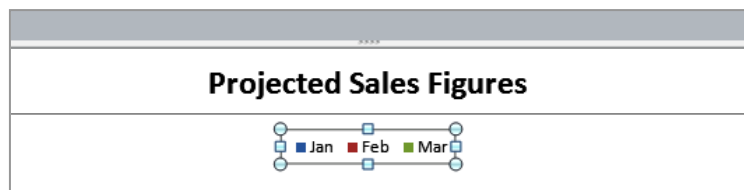
6 Click on **Legend** , then select **Show Legend at Right**



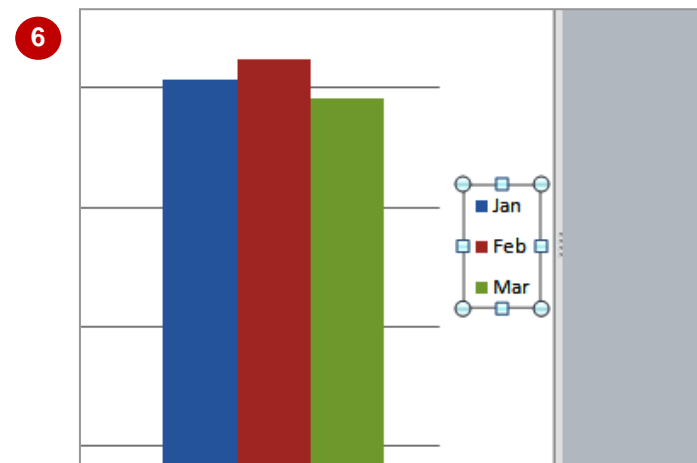
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For Your Reference...

To **position** a **legend**:

1. On the **Chart Tools: Layout** tab, click on **Legend** 
2. Select a position option

Handy to Know...

- If a legend is not displayed, you can create one by clicking on **Legend**  and selecting any of the legend position options.
- You can remove a legend by clicking on it and pressing **[Del]** or by clicking on **Legend**  and selecting **None**.

SHOWING DATA LABELS

Data labels are text boxes placed on the chart that show the actual figures behind the chart. Data labels can show the value, the category label or the percentage of a total. They are

particularly useful for pie charts as they can be used to show the exact percentage of each slice. Data labels can be placed in several pre-set positions on the chart.


Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_4.xlsx*...

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab

At the moment the columns show you roughly how large the number is, but no detail...

2 Click on **Data Labels** , in the **Labels** group and select **Centre**

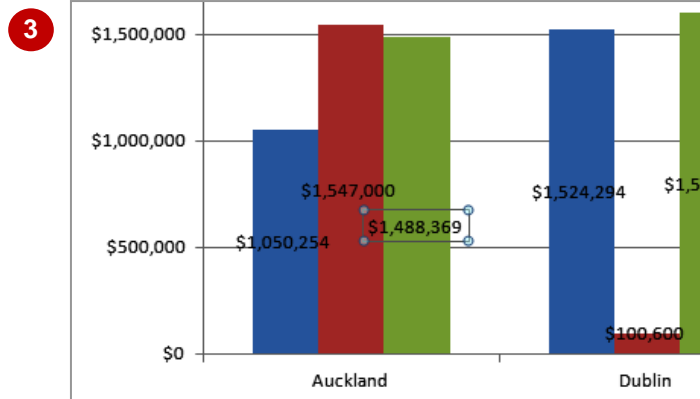
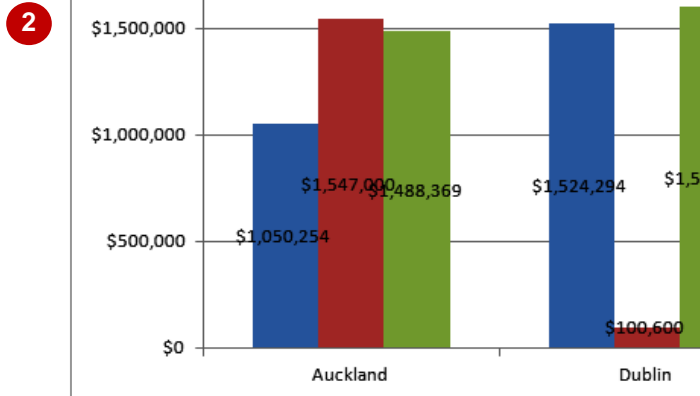
The actual figures will appear across the centre of the columns. Unfortunately some overlap a little...

3 Click on the figure in the **green** column (**Mar**) for **Auckland**

All the figures in that data series will be selected...


4 Point to the middle of the number then drag it down a little so that it no longer overlaps the previous figure

5 Repeat steps **3** and **4** to adjust the position of the data label for **Feb** (red) for **New York**




For Your Reference...

To **show data labels**:

1. On the **Chart Tools: Layout** tab, click on **Data Labels** 
2. Select the required position

Handy to Know...

- You can remove data labels by clicking on **Data Labels**  and selecting **None**.

SHOWING A DATA TABLE

A **data table**, in reference to charts, is a table of the figures used to create the chart. It allows you to report both the data and the chart in one place. A **data table** is only ever placed below the chart

itself, and the figures are aligned with their corresponding data point or column in the chart – unless you create a horizontal bar chart. You can choose to include **legend keys** if you like.


Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_5.xlsx...*

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab


At the moment, the data is shown in the columns as data labels. You can also show it outside the plot area in a table...

2 Click on **Data Table** , in the **Labels** group, to display the options

The data table is always positioned below the chart, but you can decide whether or not to display the legend keys...

3 Select **Show Data Table with Legend Keys**

The data table will be added. The individual data labels are now redundant...

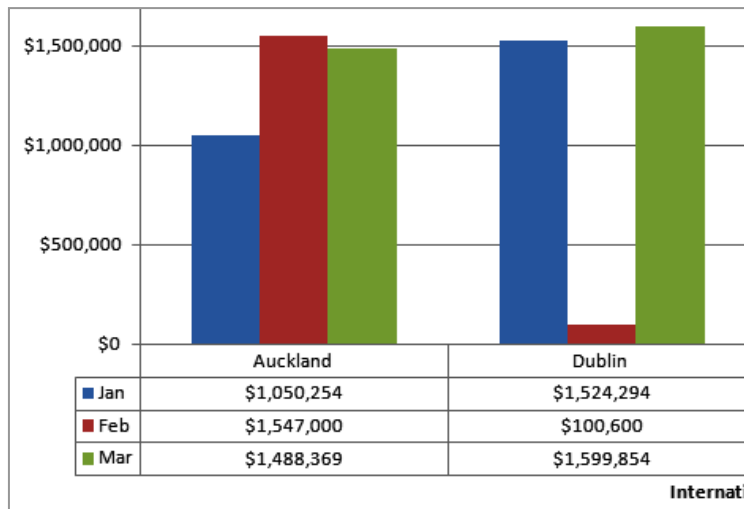
4 Click on **Data Labels**  and select **None**

The data now only appears below the chart. We'll leave the existing legend in place

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For Your Reference...

To **show** a **data table**:

1. Click on **Data Table** 
2. Select an option

Handy to Know...

- To remove a data table, click on **Data Table**  and select **None**.
- You can format the data in a data table by clicking in the data table and then applying the required formatting using the controls on the **Home** tab.

MODIFYING THE AXES

The **axes** show the **values** and **labels** for the charted data. By default, the **values** appear on the left-hand side of the chart (vertical axis) and the **labels** appear across the bottom of the chart

(horizontal axis). The position of the major units on these axes is calculated by Excel, but you can select alternative layouts and scales and even remove them altogether if you want to.


Try This Yourself:

Same
File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_6.xlsx*...

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab

On this chart, the horizontal axis is obscured by the data table, so any changes you make will not be visible. However, you can examine the options and make changes to the vertical axis which currently shows the default axis settings...

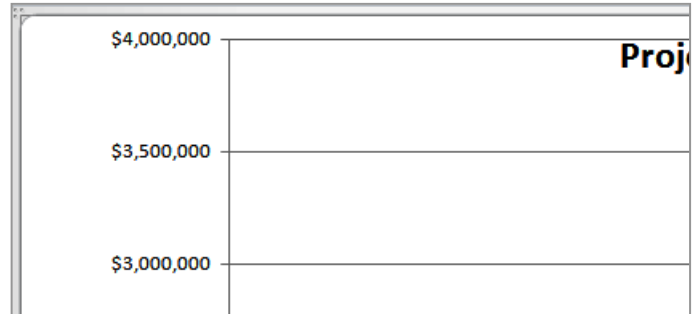
2 Click on **Axes** , in the **Axes** group, to display the submenu, then point to **Primary Horizontal Axis** to see the options

3 Point to **Primary Vertical Axis** to see these options

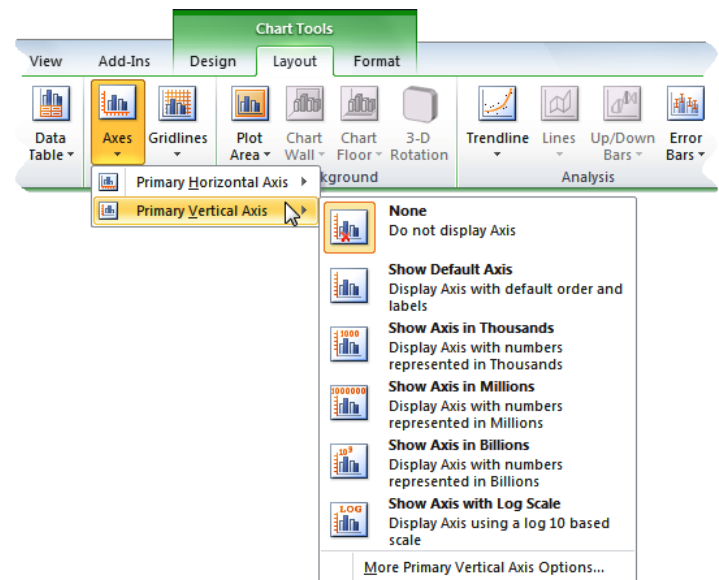
4 Select **Show Axis in Thousands**

The number of zeros in each major unit will be reduced and the label *Thousands* will appear

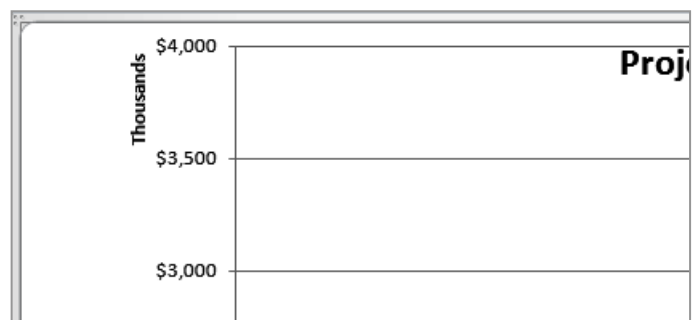
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For Your Reference...

To **modify** the **axis**:

1. Click on **Axes** 
2. Point to **Primary Horizontal Axis** and **Primary Vertical Axis**
3. Select an option

Handy to Know...

- You can modify the **Axis Options** by clicking on **Axes** , pointing to **Primary Horizontal Axis** and selecting **More Primary Horizontal Axis Options** or pointing to **Primary Vertical Axis** and selecting **More Primary Vertical Axis Options**.

SHOWING GRIDLINES

Many of Excel's chart types include major **gridlines** by default. Gridlines help you to determine the numeric value of each data point and are therefore very useful when the absolute

size of the data value is important. You can show or hide horizontal and vertical gridlines and decide whether to display them for major and/or minor units.


Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_7.xlsx*...

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab

At the moment, only the horizontal gridlines are displayed and these align with the major units...

2 Click on **Gridlines** , in the **Axes** group, and point to **Primary Horizontal Gridlines** to display the menu

Notice that *Major Gridlines* is selected...

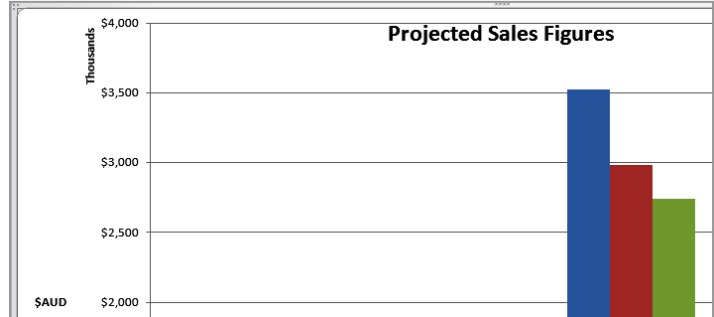
3 Point to **Primary Vertical Gridlines** to display the menu

Notice that *None* is currently selected...

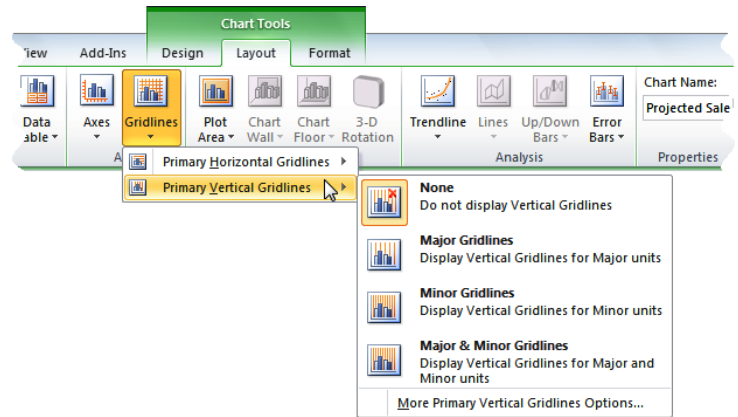
4 Select **Major Gridlines** to apply vertical gridlines to the chart

In this case they make the chart a little busy and don't add much value, but at least you can see how they work

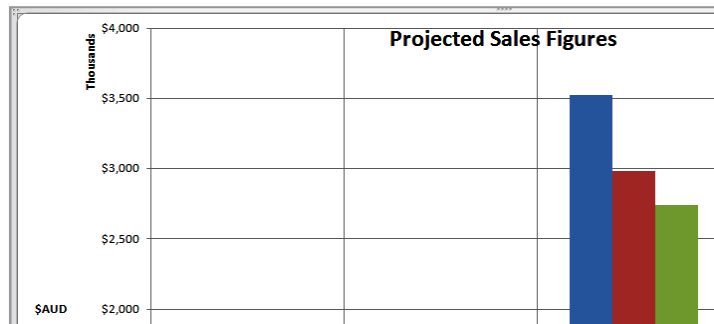
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For Your Reference...

To **show gridlines**:

1. On the **Chart Tools: Layout** tab, click on **Gridlines**  in the **Axes** group
2. Point to **Primary Horizontal Gridlines** or **Primary Vertical Gridlines**
3. Select an option

Handy to Know...

- To remove gridlines, click on **Gridlines** , point to **Primary Horizontal Gridlines** or **Primary Vertical Gridlines** and select **None**.

FORMATTING THE PLOT AREA

The **plot area** is the area between the axes in which the data is plotted. You can also think of it as the chart **background**. Depending upon the default format of the chart you choose, the plot

area may be white, but you can select from a range of colours, textures or images to fill the plot area. This can enhance charts if you plan to use them for presentations.


Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_8.xlsx...*

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab


Currently, the plot area (background) is clear...

2 Click on **Plot Area** , in the **Background** group, to display the options

Currently, there is no fill set...

3 Select **Show Plot Area**

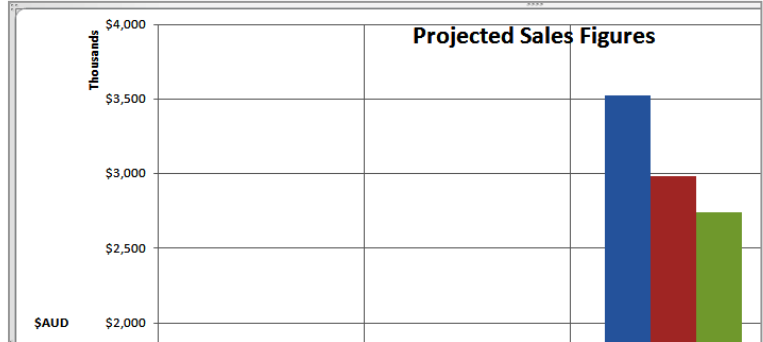
Nothing happens because the default fill is white...

4 Click on **Plot Area**  and select **More Plot Area Options** to display the **Format Plot Area** dialog box

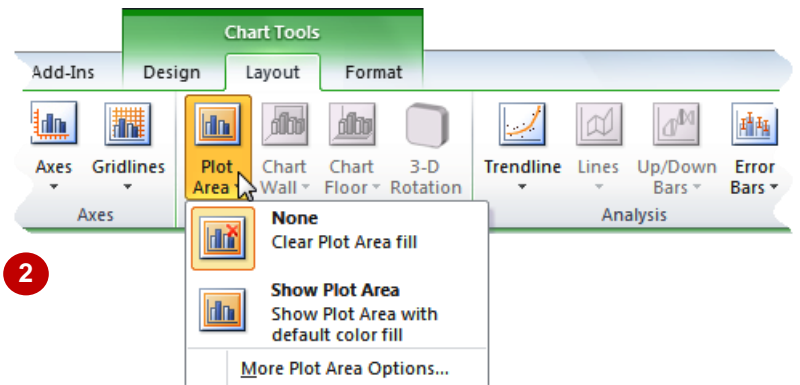
The **Fill** category settings are displayed...

5 Click on **Gradient fill** then click on **[Close]**

The plot area of the chart is now filled with a blue gradient



1




2





5

For Your Reference...

To **format** the **plot area**:

1. On the **Chart Tools: Layout** tab, click on **Plot Area** 
2. Select **More Plot Area Options**
3. Make the required selections
4. Click on **[Close]**

Handy to Know...

- To return the plot area to the default fill colour, click on **Plot Area**  and select **Show Plot Area**.
- To remove the plot area fill, click on **Plot Area**  and select **None**.

ADDING A TRENDLINE

A **trendline** is used to depict the trend, showing an average figure for the values that the chart is built on and building a prediction of what the values are likely to be. Trendlines show the


general direction of results and the expected direction of future results. There are six trend types to select from, being linear, logarithmic, polynomial, power, exponential and moving average.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_9.xlsx*...

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab

2 Click on **Trendline** , in the **Analysis** group, to display the options

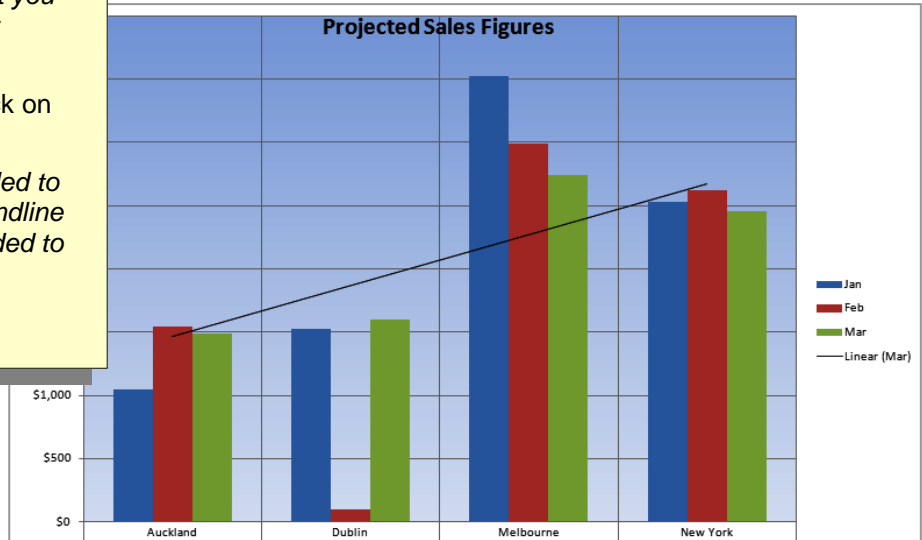
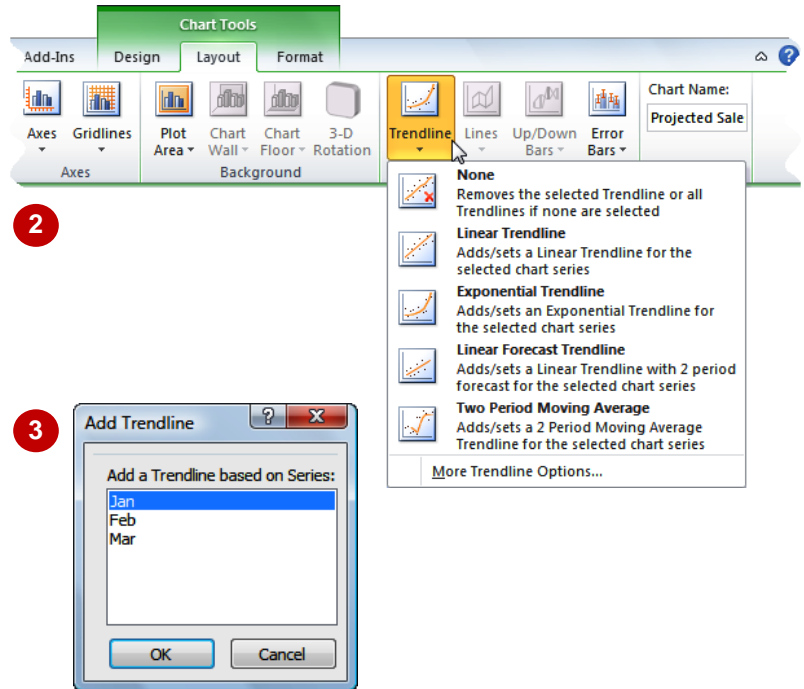
The options include various calculation methods for trends...

3 Select **Linear Trendline**

The Add Trendline dialog box will appear so that you can select a particular month...


4 Click on **Mar**, then click on **[OK]**

A trendline will be added to your chart and the trendline information will be added to the legend



For Your Reference...

To **add** a **trendline**:

1. Click on **Trendline** 
2. Select an option
3. Click on the data series you want to create a trend from
4. Click on **[OK]**

Handy to Know...

- You can add a trendline to a data series in unstacked, 2-D, area, bar, column, line, stock, xy (scatter), or bubble charts. You can't add trendlines to data series in stacked, 3-D, radar, pie, surface, or doughnut charts.

ADDING ERROR BARS

Error bars are graphical representations of possible error ranges in figures. The error bar is placed at the data point to show the possible variations in value. For example, you could use

error bars to reflect a potential 2% positive and negative variation in sampling results. There are four options for error bars, being fixed value, standard error, percentage and standard deviation.


Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_10.xlsx...*

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab

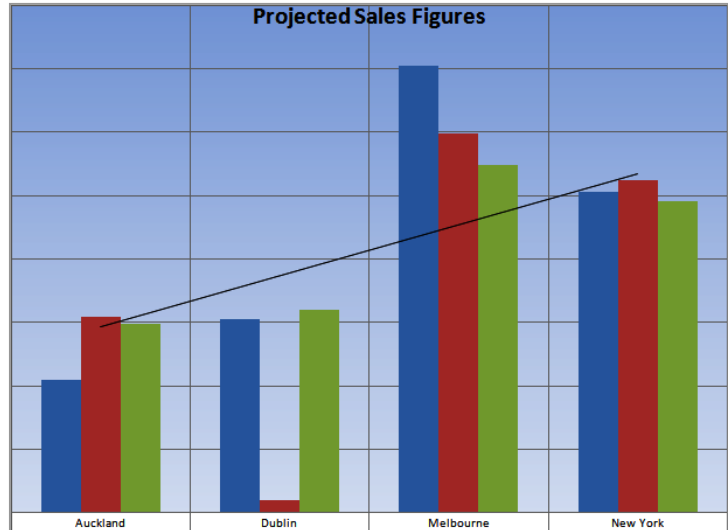
Error bars appear at the top of each column or data point. Currently they aren't shown...

2 Click on **Error Bars** , in the **Analysis** group, to display the options

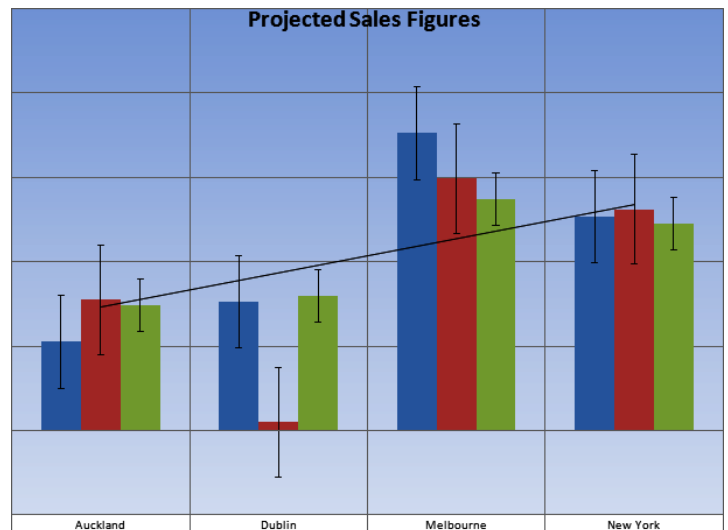
3 Select **Error Bars with Standard Error**

The error bars will be placed on the chart and the chart will adjust accordingly

1




3





For Your Reference...

To **add error bars**:

1. On the **Chart Tools: Layout** tab, click on **Error Bars** 
2. Select an option

Handy to Know...

- You can access all of the error bar options by clicking on **Error Bars**  and selecting **More Error Bars Options**.
- You can remove error bars by clicking on **Error Bars**  and selecting **None**.

ADDING A TEXT BOX TO A CHART

There may be times when, no matter which chart layout element you look at, none of them actually add the information to the chart that you need. In these situations you can use a **text box** and type


whatever you want to. Text boxes can be placed anywhere on the chart, so you can use them to add subtitles, author notes, explanations, copyright information and so on.

Try This Yourself:

Same
File

Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_11.xlsx*...

1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab

2 Click on **Text Box**  in the **Insert** group, then move the mouse pointer between the columns for **Auckland** and **Dublin**

The mouse pointer will change to an insertion point. A tool tip will tell you which part of the chart you are located over...

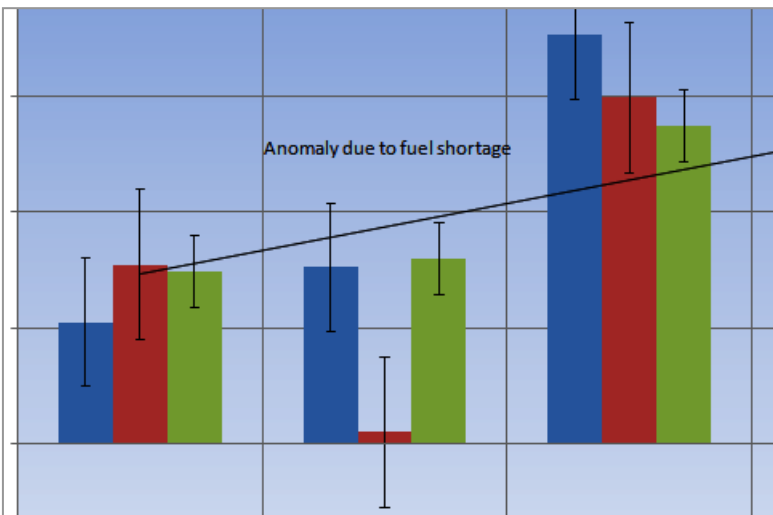
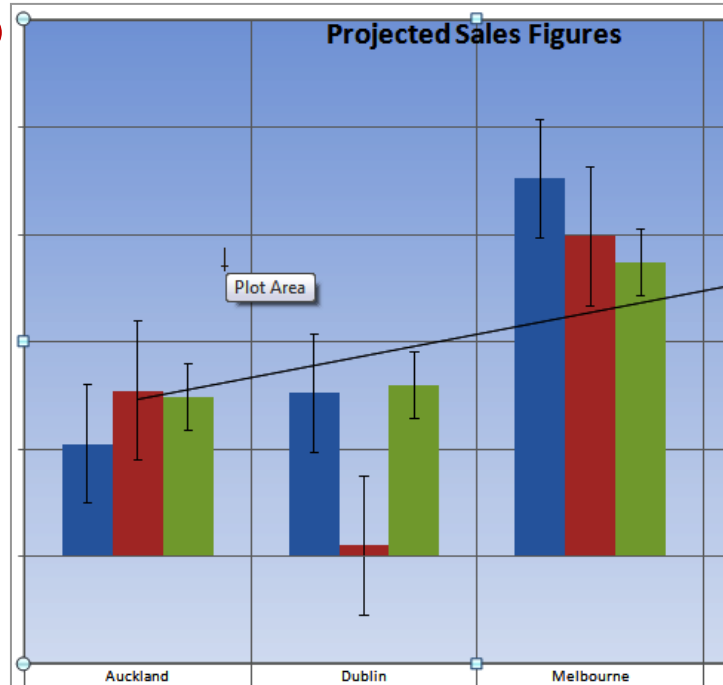
3 Click and type **Anomaly due to fuel shortage**

4 Drag the right-hand, middle handle to the right so that it fits the text

5 Drag up the bottom, middle handle so that it fits the text

6 Drag the text box to centre it between the vertical gridlines, then click in a blank area of the chart to deselect it


2






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For Your Reference...

To **add** a **text box**:

1. On the **Chart Tools: Layout** tab, click on **Text Box** 
2. Click on the chart and type the text
3. Resize and reposition the text box if necessary

Handy to Know...

- You can also add a text box to a chart by clicking on **Shapes**  and clicking on the **Text Box** which is the first icon on the left. **Shapes**  is found on the **Chart Tools: Layout** tab and the **Insert** tab. **Text Box**  is also found on the **Insert** tab.

DRAWING SHAPES IN A CHART


You can **add shapes to charts** to provide additional information, to point to specific figures, to indicate anomalies or just for decoration. There are over 160 shapes to choose from, each of

which can be resized and tweaked, including lines, rectangles, basic shapes, block arrows, equation shapes, flowchart shapes, stars and banners, and callouts.

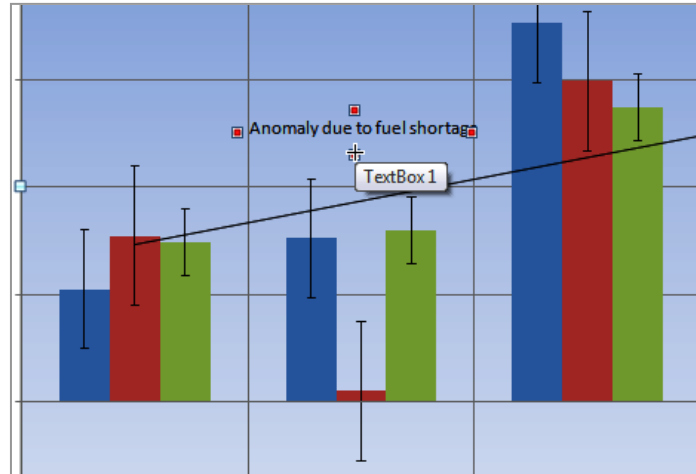
Try This Yourself:

Same File

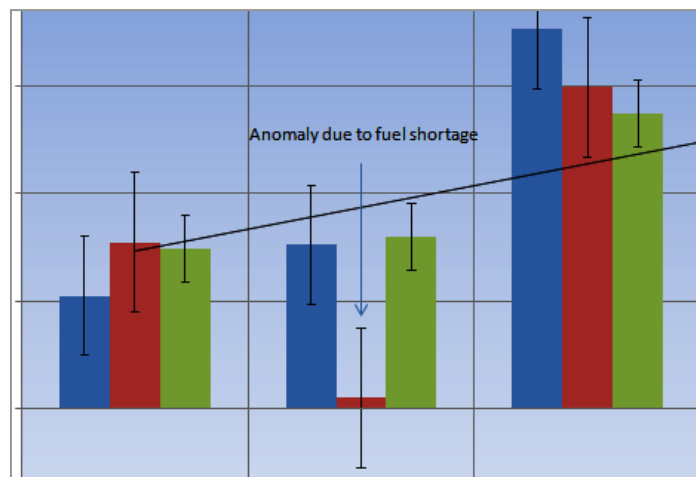
Continue using the previous file with this exercise, or open the file *E829 Charting Techniques_12.xlsx...*

- 1 If the **Chart Tools: Layout** tab is not displayed, click on the chart, then click on the tab
- 2 Click on **Shapes** , in the **Insert** group, to display the options, then point to the third shape from the left in the top row
The tool tip will tell you that it's an arrow...
- 3 Click on **Arrow** then hover over the bottom edge of the text box
Red squares will help you line up with the middle of the text box...
- 4 Hold down **Shift**, then point to the bottom, centre, red square and click-and-drag straight down to draw an arrow
Shift ensures that you draw a straight line...
- 5 Drag the arrow across slightly, if you need to, to align it with the error bar
- 6 Click on another part of the chart to deselect the arrow

3




6



Note: This chart has too many details and additions to be practical, but illustrates the types of elements that you can use to enhance charts. In reality, you would only use some of these elements and keep the layout simple and uncluttered.

For Your Reference...

To **draw a shape** on a **chart**:

1. In the **Chart Tools: Layout** tab, click on **Shapes** 
2. Click on the required shape
3. Move onto the chart, then click-and-drag to draw the shape

Handy to Know...

- Text can be added to shapes by right-clicking on the shape and selecting **Edit Text**.
- Shapes can be deleted by clicking on the shape to select it and pressing **Del**.