

Case Study – Incorporate worksheet information in a chart

There are many instances when a chart becomes easier to understand if one includes information that is present in a worksheet. While it is always possible to create a textbox in a chart and type in whatever one wants, that information is static. So, if the worksheet contents change, the chart contents remain unchanged. In this case, we link what is displayed in a chart to what is in a worksheet and, further, we do so in a manner that the text is self-contained and easy to read. For example, in the analysis for the case study titled *Launch an object*, the chart shows the initial launch speed and angle as shown in Figure 1. In the worksheet, V_0 is the launch speed and theta (θ) is the launch angle. In the chart, that information is ‘spelled out,’ so to say. And, yes, if the user changes the worksheet cell contents, the chart should update itself.

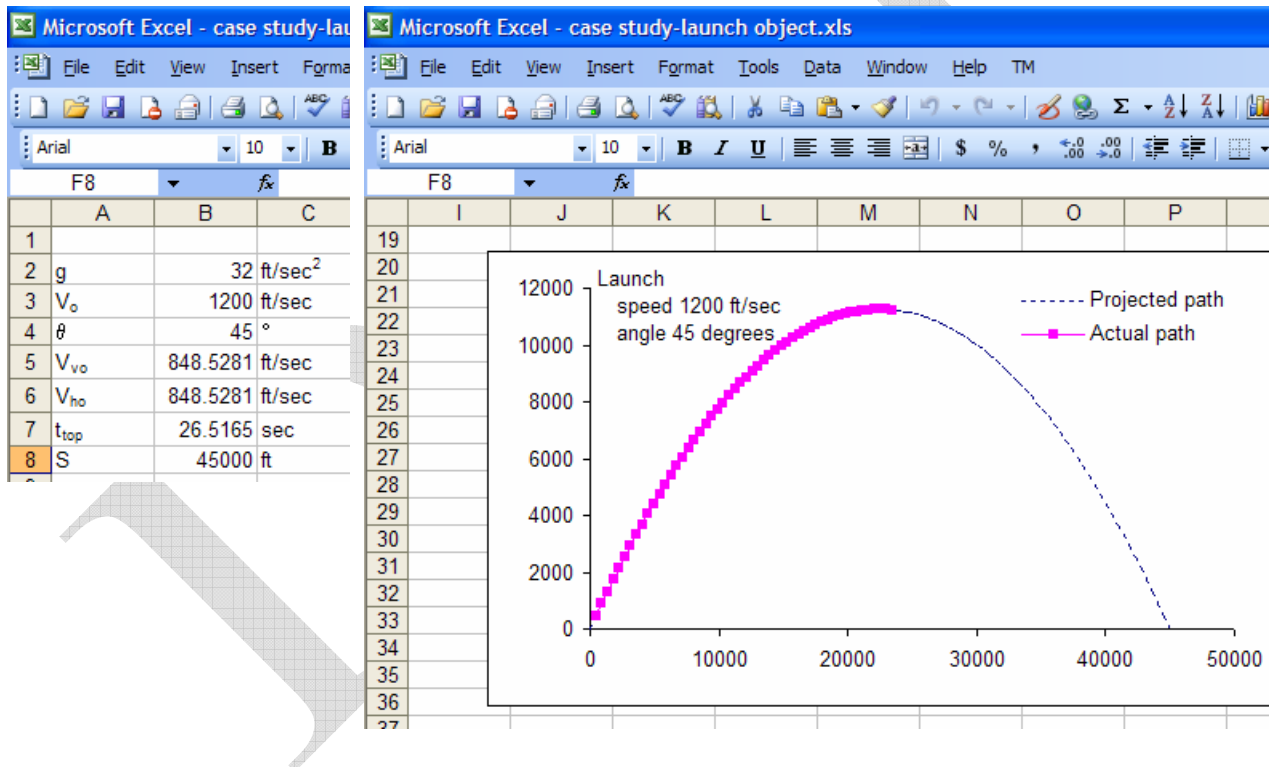


Figure 1

There are two parts to pulling this off. The first is using an Excel formula so that all the information we want to display is aggregated in a single worksheet cell. The other is knowing that a textbox in a chart can be linked to a worksheet cell.

Putting together all the information

Start by putting together all the information in a single cell. Note that we need the launch speed from cell B3, the measurement dimension from cell C3, and the launch angle from B4. In addition, we want to add appropriate words explaining the numbers and, finally, we want the different pieces shown on different lines.

Forcing a textbox to split information across lines is done by inserting a newline character, i.e., CHAR(10). Combining literal strings and cell contents is done with the concatenation operator, &. In some cell, say E3, enter the formula

```
= "Launch"&CHAR(10)&" speed "&V0&" "&C3&CHAR(10)&" angle " &theta&" degrees"
```

where V0 is the name given to cell B3 and theta is the name given to cell B4. Also, note that there are three spaces preceding the word *speed* as well as the word *angle*. The result should as in Figure 2.

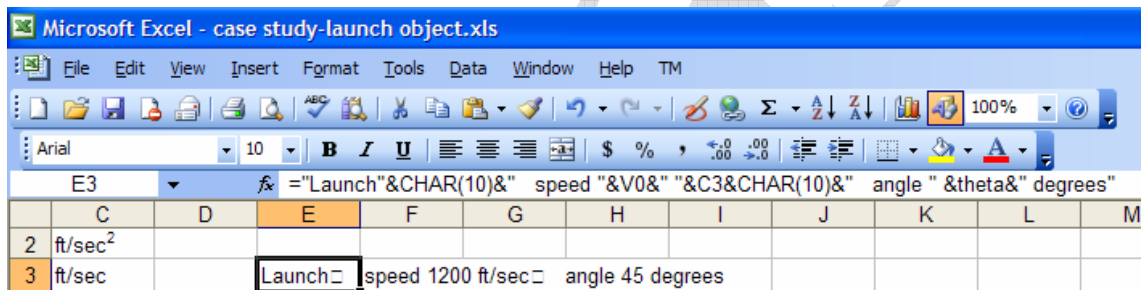


Figure 2

Showing the information in a chart

The easiest way to show this information in a chart is with a textbox linked to a worksheet cell. To do so, select the chart, type the equal (=) key, and use the mouse to select the cell containing the above formula. Excel will add a new textbox to the chart and link it to the specified cell. Double-click the textbox border to access the Format Textbox dialog. From the Alignment tab, (a) check on the option for 'Automatic size', and (b) from the 'Text alignment' section, set the Horizontal to 'Left'. Once done, click-and-drag the textbox to position it as desired. The result is shown in Figure 1

Custom formatting individual components

The above technique does not lend itself to custom formatting of individual characters. For example, if the contents of a textbox are just typed in as text, it is possible to custom format

individual letters. In Figure 3 the text in the middle contains multiple custom format settings for specific characters. Some letters are bold, one is subscripted, another is superscripted, and some words are in blue. To do this, just type the text in a textbox. Then, select the characters to be custom-formatted and select **Format | Textbox...** (yes, the menu name is misleading). Whatever changes are made in the resulting dialog box will apply only to the selected characters.

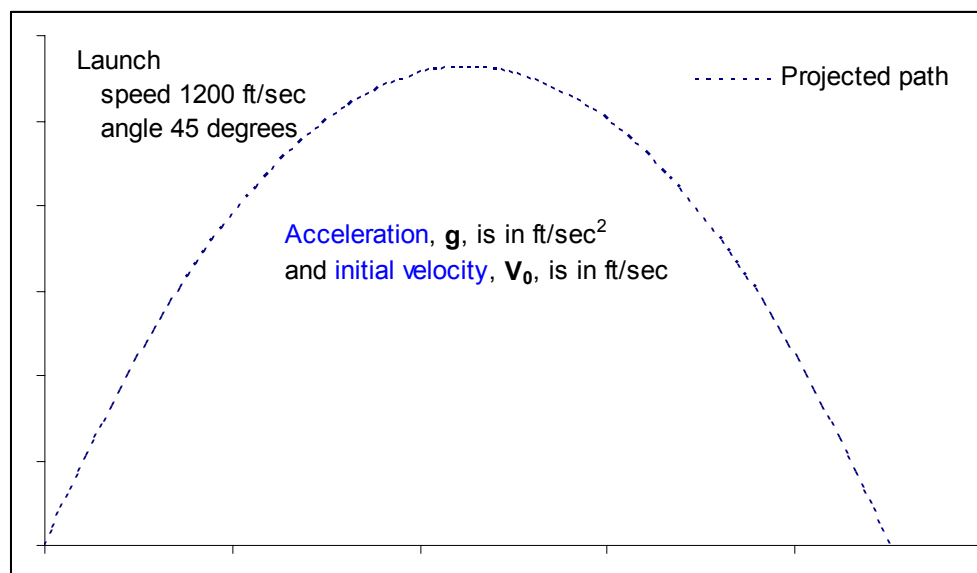


Figure 3

Custom format individual components of linked textboxes

So, how do we combine the technique of linking a chart textbox to a cell and the still retain the custom format capability? We can't. But, we can simulate the effect! What if we break up the text into multiple textboxes, some linked to worksheet cells, and then format different textboxes and typed characters individually? Let us return to the first example. Now, suppose that we want the information as shown in Figure 4.

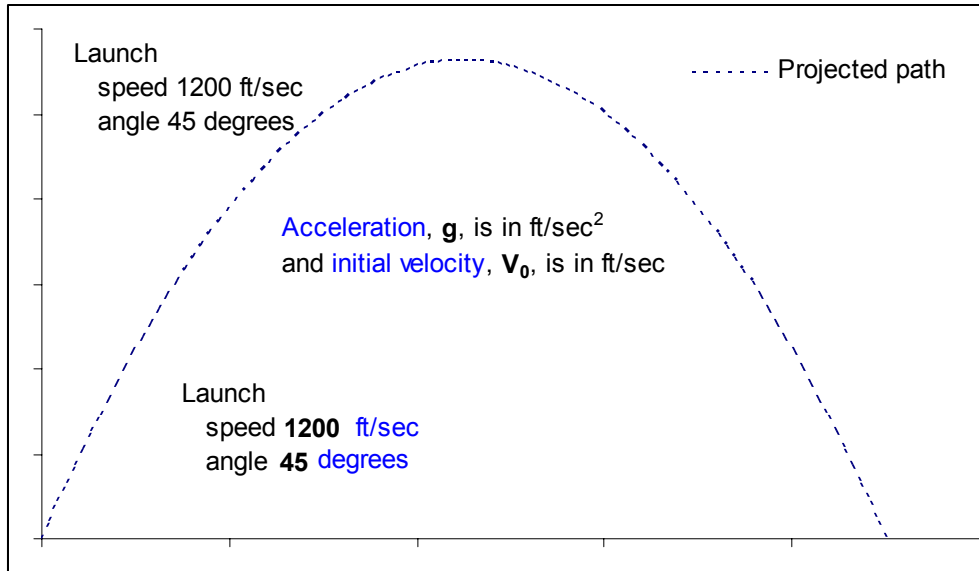


Figure 4

Look at the text towards the bottom of the chart. It looks the same as that in the top-left corner. However, now, the numbers are bold and the measurement units are in blue. How would we do this? We create multiple textboxes as shown by the selected boxes in Figure 5. Some (the two numbers and the ft/sec boxes) are linked to worksheet cells (B3, B4, and C3, respectively), the others contain typed text. Next, we format the individual textboxes as desired. Finally, we position all the boxes so that the overall effect is the one shown in Figure 4.

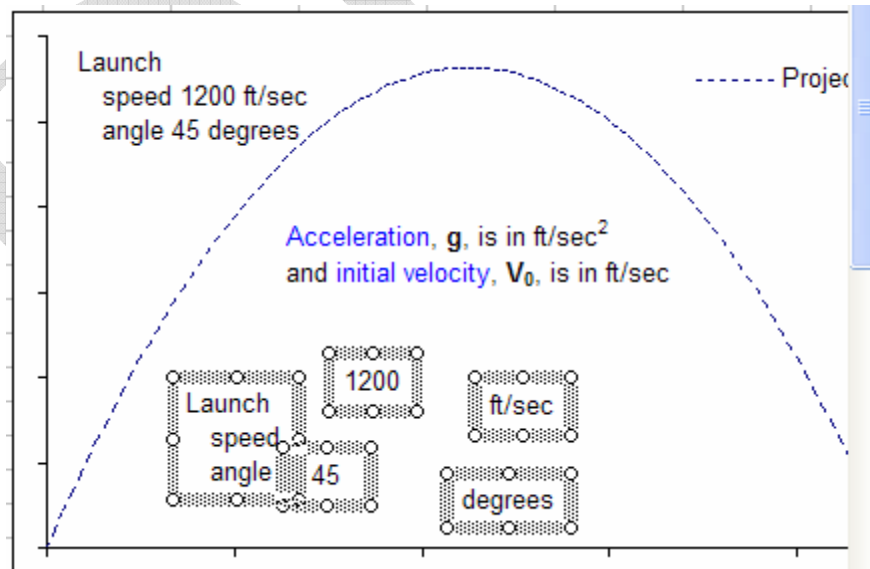


Figure 5

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