

SECTION

4

Microsoft Excel



4 | Microsoft Excel

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I'm a member of the engineering and maintenance department here at *Big Planet Theme Park*. My team and I are responsible for making sure that all of the rides are properly maintained and safe for visitors. Just imagine what would happen if the *Haunted Castle* ride broke down when people were half way through it!

My main role at the park is to reduce costly breakdowns and help develop ways to improve the overall safety and reliability of the rides. I have plenty of mechanical and engineering jobs to keep me busy, but I also spend a lot of time creating spreadsheets to manage my team's budget. We only have a small amount of money to spend, but if we invest it properly, the life of our rides will be extended and the park will save a lot of money in the long run.

To help me keep track of my team's spending, I use the program *Microsoft Excel*. Many professionals in various types of organisation use this program – it's really useful for working with numbers and performing calculations quickly and accurately. It also allows me to present complex data graphically, making it much easier to understand and communicate to others.

What you will learn:

In this section you will use the program *Microsoft Excel* to help *Zak* complete a number of everyday tasks at *Big Planet Theme Park*. You will see how to use simple spreadsheet techniques to enter, develop and organise numerical information for a variety of purposes.

Knowledge, skills and understanding:

- * Use *Microsoft Excel* to create spreadsheets and manipulate numerical data
- * Learn the best tools and features to solve a range of everyday problems
- * Apply a variety of professional editing, formatting and layout techniques

Data files



Data files needed to complete the activities in this section are provided in the **Section 4** data files folder. Spreadsheets that you create or edit can be saved to the same folder.

4.1 Using Microsoft Excel

Microsoft Excel is most commonly used to work with figures and is a perfect choice of application for any task that involves numbers. Once a spreadsheet has been set up correctly, it can be used to perform a number of complex calculations quickly and accurately (and any results will be automatically updated when the data is changed). Typically, spreadsheets can be used to help with the following tasks:

- * Maths problems, budgets and accounting
- * Cash flows and forecasts
- * Data analysis



A spreadsheet stores information in a grid of **cells**, which generally contain text, numbers or **formulas**. Cells are arranged in **rows** (across the screen) and **columns** (down the screen), forming a **worksheet**. One or more worksheets are together known as a **workbook**, the name *Excel* gives to a saved file.

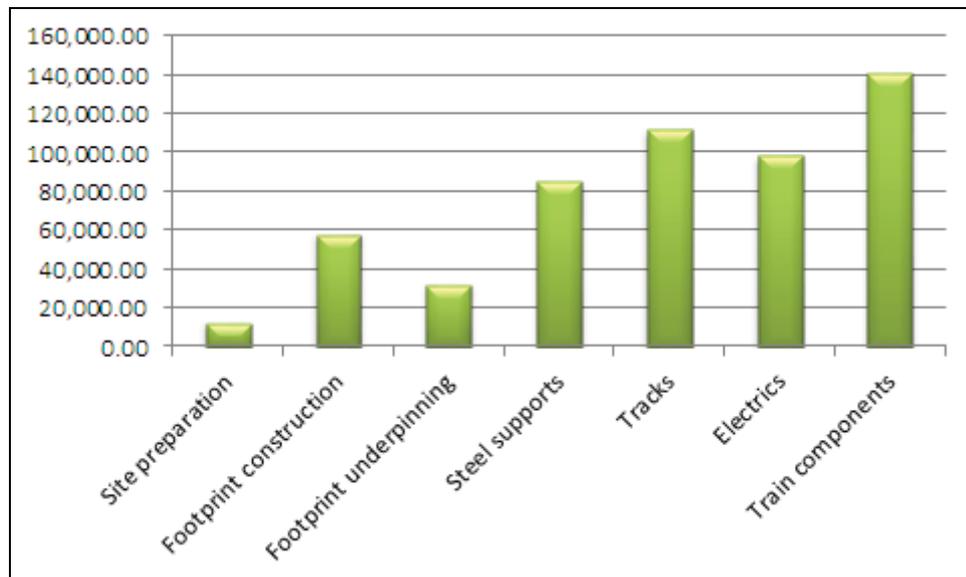
	A	B
1	Item	Cost (£)
2	Site preparation	12,500.00
3	Footprint construction	58,000.00
4	Footprint underpinning	32,000.00
5	Steel supports	85,000.00
6	Tracks	112,325.00
7	Electrics	98,750.00
8	Train components	140,850.00
9		
10	Total	539,425.00
11		

Notice the numbers running down the left side of the spreadsheet and the letters running across the top. These are called **Heading Bars** and are used to **reference** cells. In the picture above, the cell **B5** is currently selected (the location where **Column B** and **Row 5** intersect). This is highlighted on the **Heading Bars** and shown in the **Name box**.

Note: When referring to a cell, the column letter always comes before the row number.

Note: Although mainly used for working with numbers, people also use spreadsheets for creating and working with simple lists of data (e.g. product lists, stock lists, customer contact lists, etc).

Spreadsheets can also take basic data and present it in a variety of attractive graphs and charts. One important advantage of this is that the graphics created are much easier to understand at a glance. They can also be really useful for including in other documents or presentations.



4.2 Creating a Spreadsheet

When creating a spreadsheet you should start on **Sheet1** (the default worksheet) and begin entering data in the top left corner. You should also add **labels** to the top of columns or the start of rows to help describe the contents of the worksheet.

It is very important to enter numbers correctly and accurately. If you make mistakes the spreadsheet will produce the wrong results.

Activity:

1. Start *Excel*. A blank workbook is created by default.

Note: Notice that cell **A1** is currently selected (it is the **active** cell). The workbook contains three worksheets by default; **Sheet1**, **Sheet2**, **Sheet3**.

2. A label is entered into a cell by typing. Type **Maintenance checks week 7**.

	A	B	C	D	E	F
1	Maintenance checks week 7					

Note: When entering text into a cell, notice that it also appears in the **Formula Bar**.

3. To complete the cell entry, press **<Enter>**. The active cell moves down to cell **A2**.

Note: The text looks as though it also occupies cells **B1** and **C1**, but this is not the case. A label will expand and appear on top of other cells if – and only if – the other cells are empty. Cells containing numbers do not do this.

4. You can move to other cells by pointing and clicking or by using the arrow keys on your keyboard. Press the down arrow key, ↓, to move to cell **A3**, and then type **Staff**.

	A	B	C
1	Maintenance checks week 7		
2			
3	Staff		

5. Next, press → to move to cell **B3** (you do not need to press <Enter> to confirm an entry).
6. The worksheet that you are creating is to be used to record daily safety checks for the park's engineering and maintenance team. Enter data as shown below.

	A	B	C	D	E	F	G	H
1	Maintenance checks week 7							
2								
3	Staff	Mon	Tue	Wed	Thu	Fri	Sat	Sun
4	Aaron							
5	Adya							
6	Jack							
7	Sun							
8	Zak							

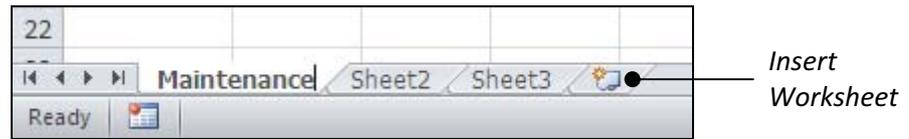
7. The actual maintenance figures now need to be entered. Move to cell **B4** by clicking it and then enter the number **16**. Enter the data below using whichever technique you like to move between cells (note that each employee has two days off).

	A	B	C	D	E	F	G	H
1	Maintenance checks week 7							
2								
3	Staff	Mon	Tue	Wed	Thu	Fri	Sat	Sun
4	Aaron	16	22	9	17	20		
5	Adya	21	16	19	15			12
6	Jack		19	15	14	17	11	
7	Sun			18	32	21	12	10
8	Zak	12	16			24	14	11

Note: Notice that numbers appear right aligned by default. This helps you to tell at a glance which cells contain text and which cells contain numbers.

Note: You can change a worksheet's name simply by double clicking the relevant tab at the bottom of the screen and typing a new title.

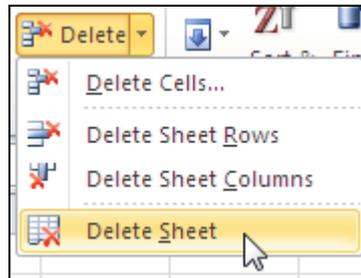
8. Double click the current worksheet's title tab (**Sheet1**) and enter the title **Maintenance**.



9. Press <Enter>. The worksheet has been renamed.
10. Click the **Sheet2** tab to display that worksheet. Click the **Maintenance** tab again to return to the first sheet.

Note: To add a new worksheet to your workbook, click the **Insert Worksheet** button. It is a good idea to keep all relevant worksheets in the same workbook.

11. Display **Sheet2** again. From the **Cells** group on the **Home** tab, click the drop-down arrow on the **Delete** button and select **Delete Sheet**.



12. The worksheet is deleted and the next available sheet selected. Delete **Sheet3** also, leaving only the **Maintenance** worksheet remaining.

Note: In the same way that you can protect documents in *Microsoft Word*, you can also protect workbooks in *Excel*. For instance, your spreadsheets can be password protected or marked as **Final** so that changes are discouraged.

13. Save the workbook as **maintenance** and then close it.

4.3 Resizing Columns and Rows

You may sometimes need to change column widths and row heights to better display the contents of cells and to make your spreadsheets easier to read. This is simply done by dragging the column or row boundaries on the relevant **Heading Bar**.

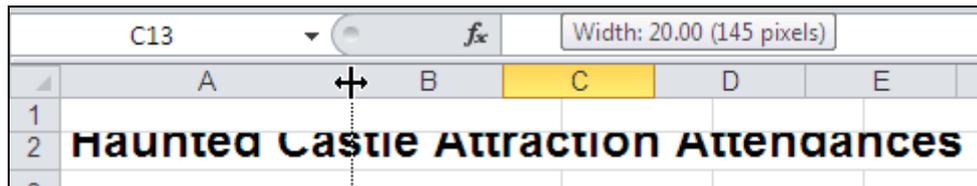
Activity:

1. Open the workbook **Attendance**. This file contains information on visitor numbers to five specific *Haunted Castle* attractions. Unfortunately, it has been very poorly designed and many of the labels have been obscured.

2. Move your mouse pointer to the boundary line between column **A** and column **B** in the column **Heading Bar**. The pointer changes to a double-headed arrow, .

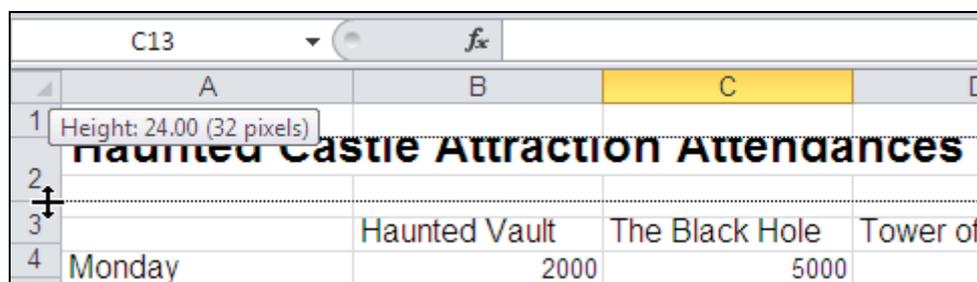


3. Using click and drag, reduce the width of column **A** to approximately **20.00** (the column's width is shown in a **ToolTip** as you drag).



Note: Width is measured in number of characters (20 will show 20 standard characters).

4. Using the same technique, increase the widths of columns **B**, **C**, **D** and **E** to **17.00**.
5. Row 2 is too small (in height) to contain the text contained in **A2**. Place the mouse pointer over the border between row 2 and 3 on the row **Heading Bar**, and using click and drag, increase the height of row **2** to approximately **24.00**.



Note: For more precision, right click a column header and select **Column Width**. You can then enter a precise value. To adjust a row, right click and select **Row Height**.

Note: Similar to *Microsoft Word*, *Excel* also has a **Zoom** feature on the **Status Bar** for zooming into worksheets.

6. Use the **Zoom Slider** on the **Status Bar** to increase the zoom level to **150%**.
7. Use the **Zoom Slider** to restore the zoom level to **100%**.

Note: You can continue this section using any zoom level that you feel comfortable with.

8. Save the workbook as **visitors** and close it. You will use this file again later.

4.4 Basic Formulas

Formulas are used to calculate results from numbers entered in a spreadsheet. For example, formulas can be used to add a column or row of numbers together to obtain a total. If the data is changed, the formula will automatically recalculate the result.

Activity:

1. Display the **File** tab and start a new, blank workbook.
2. In cell **B2** enter **34** and in cell **B3** enter **16**.

Note: Although it is common practice to start creating spreadsheets from the upper left corner, you do not always need to start in cell **A1**. In fact, you can enter data in any cell that you like.

	A	B
1		
2		34
3		16

3. Make **B5** the active cell by clicking on it.
4. To add the contents of **B2** and **B3** together and display the result in **B5**, type in the formula **=b2+b3** and press **<Enter>**.

Note: All formulas begin with an equals sign, =, followed by the calculation. Cell references are used so that results are recalculated if data in those cells change.

5. Cell **B5** now displays the result of adding cells **B2** and **B3** together (**50**).
6. Click cell **B5** and notice that the **Formula Bar** displays **=B2+B3**, the formula for this cell.

Note: It is usually quicker to use the numeric keypad on the right of a standard keyboard for entering large amounts of numbers. However, you may need to activate the **Num Lock** feature on your keyboard first by pressing the **<Num Lock>** key (a light on your keyboard will appear when it is activated).

7. Click in cell **B3** and enter **26** to overwrite the original contents.
8. Press **<Enter>** and the formula updates **B5** to **60**, the new solution.

Note: You will learn a lot more about formulas as you progress through this section.

9. Close the workbook without saving.

4.5 Mathematical Operators

The basic mathematical operators are **add**, **subtract**, **multiply** and **divide**. You will need to use these operators in your formulas to produce calculations (you have already used **add** in the previous exercise). However, the symbols for these operators on a keyboard are slightly different to those that you may be used to.

+	Add
-	Subtract
*	Multiply
/	Divide

These symbols appear twice on the keyboard; one set is placed around the main keyboard and the other set is placed on the numeric keypad. Many people find that the numeric keypad is easier to use because the keys are closer together and the <Shift> key is not needed.

Activity:

1. Open the workbook **Operators**.
2. Make **B6** the active cell by clicking on it, and then type in **=b4+b5**.

	A	B	C	D	E
1	Mathematical Operations				
2					
3	Number	Add	Subtract	Multiply	Divide
4	First	6	7	3	12
5	Second	3	4	5	4
6	Result	=b4+b5			
7					

Note: Notice that, as you type the formula, the referenced cells are highlighted on the worksheet. Lower case (small) letters will be automatically capitalised.

3. Press <Enter>. This creates a formula to add the contents of cells **B4** and **B5**. The answer is displayed as **9**.

Note: Have you noticed the pop-up menu that appears when you enter formulas? This is used to create more complex formulas which you will learn more about later.

4. Click in cell **C6** and enter the formula to subtract the two numbers above, **=c4-c5**. Rather than press <Enter>, press the right arrow key, →. The answer is displayed as **3**.
5. In cell **D6**, enter the formula to multiply the two numbers above, **=d4*d5**. The answer is displayed as **15**.
6. In cell **E6**, enter the formula to divide the two numbers above, **=e4/e5**. Press <Enter> and the answer is displayed as **3**.

	A	B	C	D	E
1	Mathematical Operations				
2					
3	Number	Add	Subtract	Multiply	Divide
4	First	6	7	3	12
5	Second	3	4	5	4
6	Result	9	3	15	3
7					

- Save the workbook as **operators complete** and close it.

4.6 Brackets

If more than one operator is used in a single formula, the order they appear is very important. For the four operators that you have seen so far, *Excel* performs calculations in this order: **Brackets**, **Division**, **Multiplication**, **Addition** and finally **Subtraction** (the **BODMAS** rule in maths). As brackets come first, they can be used to force *Excel* to perform calculations in a different order.

For example, in the formula **A1+A2/A3**, the value in cell **A2** would be divided by **A3** first and then added to **A1**. However, brackets can be used to make sure **A1** is added to **A2** first before being divided by **A3**, as the following formula shows: **(A1+A2)/A3**.

Activity:

- Zak has asked you to work out how many people are able to ride the *Haunted Castle's Black Hole* attraction at a time. Start a new, blank workbook.
- The *Black Hole* ride has two trains which always leave together. Each train has 10 cars and each car can hold a maximum of 4 passengers. Starting in **B2**, enter the following data (and increase the size of the columns so that the labels all fit).

	A	B	C	D	E
1					
2		Passengers per car	Train 1 cars	Train 2 cars	Capacity
3		4	10	10	

- To work out how many people can ride the attraction – its *capacity* – the number of passengers per car must be multiplied by the total number of cars for both trains.
- Click on cell **E3** and type the formula **=b3*c3+d3**. Press <Enter> and the answer given is **50**. Unfortunately, this is wrong – but can you tell why?
- Due to the rules of **BODMAS**, the multiplication was carried out *before* the addition. Click on cell **E3** and press the <Delete> key to remove the formula.
- This time you will use brackets to make sure the addition occurs first. Type in the following formula instead: **=b3*(c3+d3)** and press <Enter>.

7. Check that the answer displayed is now **80**; passengers per car multiplied by the total number of cars.

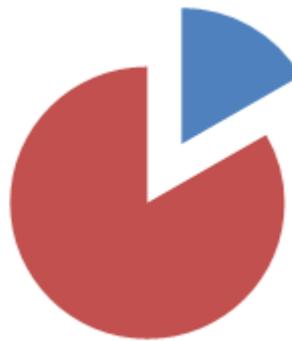
Passengers per car	Train 1 cars	Train 2 cars	Capacity
4	10	10	80

Note: Brackets can also be placed inside of other brackets.

8. Good job. Save the workbook as **capacity** and close it.

4.7 Percentages

Percentage means “per hundred” and is a technique used frequently in business and everyday life to describe a fraction out of 100. It is always displayed with a percentage symbol, %. For example, **20%** is **20/100** as a fraction or **0.2** as a decimal. In the pie chart below, **20%** has been cut out leaving **80%** remaining.



In *Excel* there is a **Percent Style** button, , that changes a decimal to a percentage automatically.

Activity:

- For a report that *Zak* is creating, you have been asked to work out what percentage of special effects on the *Black Hole* ride are “pop-up ghosts”.
- Create a new, blank workbook. Starting in **B2**, enter the following data (resize any columns as necessary).

	A	B	C	D
1				
2		Pop-up Ghosts	All Special Effects	Percentage
3		5	20	
4				

- To display the number of pop-up ghosts as a percentage of all special effects, enter the formula **=B3/C3** into **D3**. Press **<Enter>**.

4. The result **0.25** appears as a decimal value. To format the answer as a percentage, first make sure **D3** is active.
5. With the **Home** tab displayed on the **Ribbon**, click the **Percent Style** button, , in the **Number** group. The result changes to a percentage, showing that **25%** of all special effects are pop-up ghosts.
6. Change the value in **C3** to **27** and press <Enter>; notice that the percentage value changes automatically.

Note: The **Percentage Style** button only shows percentages in whole numbers.

7. To display percentages to two decimal places, make the active cell **D3** and click the dialog box launcher on the **Number** group to display the **Format Cells** dialog box.
8. With **Percentage** selected under **Category**, change the value in the **Decimal places** box to **2** (notice the **Sample** area above which previews the percentage style).
9. Click **OK** to confirm the change. The percentage is now shown as **18.52%**.
10. Click **Undo**, , on the **Quick Access Toolbar** to undo this change. The percentage is shown rounded up to **19%** again.

Note: **Undo** and **Redo** in *Excel* work in the same way as *Microsoft Word*.

11. Save the workbook as **ghost percentages** and close it.

4.8 Ranges

A **range** is a rectangular collection of cells. Just as single cells are identified by a cell reference, ranges are identified by the first and last cell in the selection. For example, the four cells **B2**, **B3**, **C2** and **C3** can be identified by the range **B2:C3**.

	A	B	C	D
1				
2				
3				
4				

Ranges are selected by clicking and dragging to highlight a number of cells. Entire rows or columns can also be selected by clicking row or column headings.

Activity:

1. Start a new, blank workbook.

2. Move your mouse pointer over cell **B2**. Then, click and drag so that a range of four cells (two rows and two columns) is highlighted (as shown on the previous page).
3. Release the mouse button. Notice that the first cell in the range is white and the other cells are highlighted in blue. The first cell is the active cell.
4. More than one range can be selected at a time by holding down the <Ctrl> key while clicking and dragging. Press and hold <Ctrl> now and click and drag the range **C5:D6**. There should now be two separate ranges highlighted.

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					

5. Click anywhere on the worksheet to remove the selected ranges. Next, click on **B** in the column **Heading Bar**. All of column **B** is now highlighted.

	A	B	C	D
1				
2				
3				
4				

6. Click on **2** in the row **Heading Bar**. All of row **2** is now highlighted. Click and drag on the row **Heading Bar** to select the row headings from **5** to **7**. Three rows are now selected.

4				
5				
6				
7				

7. A range can also be selected by clicking the first and last cell while holding down the <Shift> key. Click on cell **B2**, hold <Shift>, and click on cell **F9**. The range **B2:F9** is selected.
8. A range can be extended (or reduced) by holding down the <Shift> key and clicking on another cell. Hold <Shift> and click on cell **G12**. The range is extended to **B2:G12**.
9. Select the cell **C5** and scroll across to column **Z**. While holding <Shift> click in cell **Z5**. The range **C5:Z5** is selected.

Note: Notice that after column **Z** the headings continue **AA, AB, AC, AD**, and so on.

10. Close the workbook without saving.

4.9 AutoSum

The most common calculation used in spreadsheets is simple addition. This calculation has been simplified by the creation of a **function** called **Sum**. Functions, which are built-in formulas, are covered in more detail later.

Activity:

1. Open the workbook **maintenance** that you saved earlier.
2. In cells **A9** and **I3**, enter the label **Total**.
3. Click on cell **B9**. The five cells above need to be added together to find the total. Enter the formula **=B4+B5+B6+B7+B8** and press <Enter>. The answer should be **49**.

Note: *Why add cells that contain nothing?* Well, if numbers were placed in these cells at a later stage then the formula would still work, but a formula with cells missing from the range would not.

4. However, for large spreadsheets that contain hundreds of cells, creating a formula in this way is simply not practical. Fortunately there is a function called **SUM** that adds the contents of a range of cells.

Note: The **SUM** function is so often used that there is a button for it on the **Ribbon**.

5. Select cell **C9**. In the **Editing** group on the **Home** tab, click the **Sum** button, .
6. *Excel* automatically looks for nearby numbers to add. In this case only one number is found above. Click and drag to select the range **C4:C8** instead.

Mon	Tue	Wed	Thu	Fri
16	22	9	17	
21	16	19	15	
	19	15	14	
		18	32	
12	16			
49	=SUM(C4:C8)			

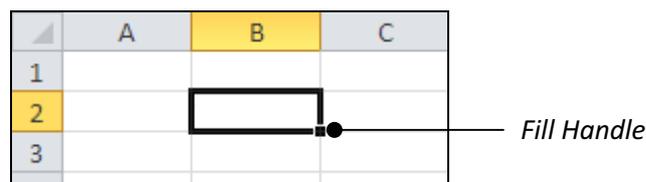
SUM(number1, [number2], ...)

7. Press <Enter> to place the answer **73** in cell **C9**. Select **C9** again and notice that the formula **=SUM(C4:C8)** appears in the **Formula Bar**.
8. Select cell **I4** and then click the **Sum** button, . *Excel* finds numbers to the left and automatically sums the 7 cells **B4** to **H4**. Press <Enter>. The answer is **84**.
9. Formulas for the other cells will be added later by copying. Save the changes to the workbook and then close it.

Note: **Sum** will automatically look up and down for numbers to sum first and then left to right. If the range it finds is wrong, simply click and drag to select a new one.

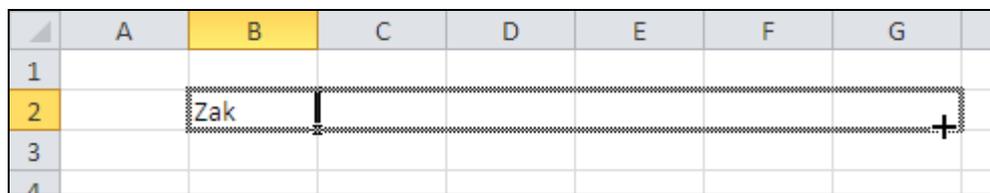
4.10 Fill Handle

Cells can be quickly filled with data by using the **Fill Handle**. This appears when the cursor is placed over the bottom right corner of an active cell. The **Fill Handle** is a very useful feature that is often used to quickly copy values or formulas into other cells.



Activity:

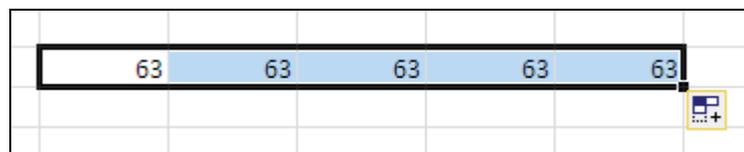
1. Start a new, blank workbook and type your first name into cell **B2**.
2. With cell **B2** selected, move your mouse pointer over the **Fill Handle**. The mouse pointer changes to a crosshair, **+**.
3. Click and drag the **Fill Handle** across to cell **G2**.



4. Release the mouse and the text in **B2** is copied to all cells in the range **B2:G2**.

Note: It is only possible to drag in one direction, i.e. along a row or down a column.

5. In **E4** enter **63**. Click and drag the **Fill Handle** of **E4** across to **I4**. The entry **63** is repeated.



6. Click the **AutoFill Options** button, , that has appeared towards the bottom right of the selected range. **Copy Cells** is currently selected which means that the value in **E4** has simply been copied to all other cells in the range.
7. Select **Fill Series** instead to have *Excel* automatically increase the value of each cell in the range. This technique is very useful for quickly numbering cells.

Note: The **AutoFill Options** button can also be used to copy (or ignore) the formatting in the source cell (i.e. the cell that is being copied).

8. Click the cell **E4** again. Hold <Ctrl> while dragging the **Fill Handle** to cell **E9**. Release the mouse button to fill the cells with increasing numbers up to **68** (holding <Ctrl> automatically applies **Fill Series**).
9. In **A11** enter **January**. Click and drag the **Fill Handle** of **A11** to **L11**. *Excel* recognises that the content of **A11** is a date, and then automatically applies **Fill Series** to the contents of each other cell in the selected range.
10. In **A13** enter **1st**. Click and drag the **Fill Handle** of **A13** down to **A23**. The automatic **Fill Series** applied is very useful when creating schedules, diaries and calendars.
11. Close the workbook without saving and then open the workbook **maintenance** that was saved earlier.
12. To save retyping the formulas in row **9** and column **I**, they can instead be copied using the **Fill Handle**. With cell **C9** selected, drag the **Fill Handle** across to **H9**.

12	16			24	14	11
49	73					+

13. When the mouse button is released, the formula contained in cell **C9** is copied to all other cells in the range **C9:H9**.

Note: *Excel* automatically updates the cell references in each copied formula so that each calculation refers to the cells directly above. This is a very useful feature.

14. Click in cell **D9** and check the **Formula Bar** to see that the formula has been updated automatically to sum column **D** instead of column **C**.
15. To complete column **I** make the active cell **I4** and drag the fill handle down to **I8**. The completed spreadsheet should look the same as that shown below.

	A	B	C	D	E	F	G	H	I
1	Maintenance checks week 7								
2									
3	Staff	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
4	Aaron	16	22	9	17	20			84
5	Adya	21	16	19	15			12	83
6	Jack		19	15	14	17	11		76
7	Sun			18	32	21	12	10	93
8	Zak	12	16			24	14	11	77
9	Total	49	73	61	78	82	37	33	

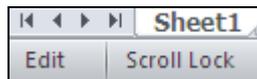
16. Save the workbook using the same file name and close it.

4.11 Editing Cells

You can change the contents of an individual cell by simply overwriting the text that is there. This is known as **In Cell Editing**. However, when a cell entry is long or complicated, the changes are sometimes best made by editing the data in the **Formula Bar**.

Activity:

1. Open the workbook **Train Cars**.
2. Click in cell **A7** and then click in the **Formula Bar**. The mode indicator on the **Status Bar** now shows the text **Edit**.



3. Use the **<Delete>** and **<Backspace>** keys to remove the label **Demon**. Enter the new label **Griffin** and press **<Enter>** to confirm the changes.

Note: You can also click the **Enter** button, , on the **Formula Bar** to accept the change.

4. Select cell **E7** which contains the value **23765**. Type **21254** to overwrite this value and then press **<Enter>** to confirm the change.
5. Select cell **E16** and overwrite with the value **1200**. Instead of pressing **<Enter>** press **<Esc>**. The change is cancelled and the value in **E16** returns to **3500**.

Note: You can also click the **Cancel** button, , on the **Formula Bar** to cancel the change.

6. The **Kraken** car has been damaged and replaced by the **Harpy**. It has the same **Ref No.**, **Colour** and **Paint Code**, but its **Mileage** is **0**. Make those changes.

15	Harpy	14	Red	1800	0
----	-------	----	-----	------	---

Note: When editing the contents of a cell, you can use the **<Home>** key to move the cursor to the start of the cell content and **<End>** to move the cursor to the end.

7. The **Vampire** car is getting old and has been taken out of action. Click on cell **A9** and then press the **<Delete>** key to remove the entry.
8. Click on cell **B9** and then click **Clear** from the **Editing** group, . Select **Clear All** from the drop-down list that appears.
9. Select the range **C9:E9** and press **<Delete>** to remove the contents of those three cells.
10. Save the workbook as **train cars updated** and close it. You will return to this later.

4.12 Cut, Copy and Paste

In the same way that you can cut, copy and paste text in *Microsoft Word*, you can also cut, copy and paste cells in *Excel*. You can cut and copy labels, values and formulas. Importantly, any formula that you copy to another location will be automatically adjusted so that it refers to the appropriate cells around it (this does not happen when you cut and paste a formula).

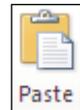
Activity:

1. Open the workbook **Breakdowns**. This spreadsheet contains an account of all ride failures that occurred last year in the *Haunted Castle*.
2. The label in cell **D10** is in the incorrect place. Select the cell and click **Cut**, , from the **Clipboard** group of the **Home** tab (you can also press <Ctrl+X>).



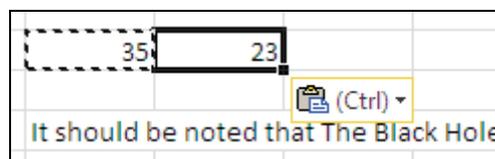
Note: Unlike most other programs, the cut item is not removed immediately. Instead, an animated box is placed around it.

3. Select cell **B13** and click the **Paste** button from the **Clipboard** group (or press <Ctrl+V>). The cut cell is then moved to the new location.



Note: Cut or copied cells are placed in a hidden area called the **Clipboard**, from where they can then be pasted back into the same worksheet, a different worksheet in the same workbook, or a completely different workbook altogether.

4. The result in **C10** needs to be in **B11**. Use cut and paste to move the formula in **C10** to the empty cell **B11**.
5. Copy the formula in **B11** using the **Copy** button,  (or press <Ctrl+C>). Paste it into **C11**. *Excel* automatically adjusts the copied formula to reference the cells in the new column.



6. Select cell **D11** and click **Paste**. The formula is pasted a second time and updated again.
7. Select the range **E11:M11** and click **Paste**. The copied formula is pasted into all cells in the range and updated to reference the correct cells in each case.
8. Use this technique to copy the formula in cell **N5** to the range **N6:N9**.
9. Save the document as **breakdowns complete** and close it.

4.13 Checking Formulas

Spreadsheets aren't much use if the formulas within them contain errors. All formulas within worksheets should be checked thoroughly to make sure that you have entered them correctly and that they produce the expected results.

In some cases *Excel* will warn you that a formula is incorrect. If so, a formula error value starting with a # (hash) symbol is displayed in the relevant cell:

#NULL!	The ranges specified in your formula are incorrect
#DIV/0!	You tried to divide by 0 and this is not allowed
#VALUE!	You tried to apply a calculation with data of the wrong type
#REF!	Cell references are not valid or are missing
#NAME?	A part of the formula has been mistyped
#NUM!	The result created by a formula is too big
#N/A	A value referenced in your formula is missing
#####	The result is too long to fit into a cell

Activity:

1. Open the workbook **Totals**. This spreadsheet shows the monthly number of visitors to the *Haunted Castle* in a six month period. Unfortunately, it also contains a number of errors which must be corrected before the results can be relied upon and used.

Note: Notice the green triangles in the top left corner of some of the cells. These indicate that there is a possible error in the formulas for those cells.

2. Click once in cell **B5**. This cell contains the error **#VALUE!** indicating that the formula is using data of the wrong type.
3. Notice the **Trace Error** button that has appeared beside the selected cell, . Place your mouse pointer over this button without clicking to see a brief description of the error.

	Month 1	Month 2	Month 3	Month 4	Month 5
riders	200	300	400	-100	150
	#VALUE!	300	700	600	750

A value used in the formula is of the wrong data type.

4. Double click in the cell. The formula for that cell is shown within the cell itself, with coloured borders indicating the ranges used in the calculation. This is a really useful way of checking the cells referenced by a formula. Can you tell what the error is?
5. The formula is trying to add the *label* in **A5** to the *value* in **B4**. Edit the formula so that it simply reads **=B4**. The error value disappears and **200** is shown in **B5**.
6. Next, click once in cell **H4** and read the brief description on the **Trace Error** button.

7. *Excel* has detected that the formula contains unrecognised text and has displayed the **#NAME?** error value in the cell. Can you see what the error is?
8. The function **SUM** has been spelled incorrectly. Correct this and press <Enter> to remove the error value.
9. The result appears as **0**, which is clearly not correct. Double click **H4** to see the range that the formula refers to.

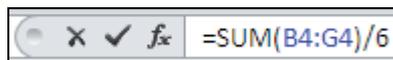
Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Total
200	300	400	-100	150	500	=SUM(B7:G7)
200	300	700	600	750	750	SUM(number1,

10. The range **B7:G7** is not correct. You could edit the formula in the cell, but instead try dragging and dropping the blue range rectangle to the correct location, as shown below.

Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Total
200	300	400	-100	150	500	=SUM(B4:G4)
200	300	700	600	750	750	SUM(number1,

Note: You can also drag the corners of the rectangle to expand/contract a range.

11. Press <Enter> to confirm the change. The formula is now correct.
12. Next, click once in cell **I4** and read the brief description on the **Trace Error** button. *Excel* has detected that the formula is trying to divide by 0 and has displayed the **#DIV/0!** error.
13. Click the drop-down arrow on the **Trace Error** button and select **Edit in Formula Bar**. The formula should divide by **6** in order to get the monthly average – correct this now.



14. Press <Enter> to confirm the change. The average formula is now correct.
15. Although all of the errors that *Excel* warned you about have now been corrected, there are still a few errors remaining in this spreadsheet. Can you tell what they are?
16. Firstly, the cell **C5** should add the contents of **B5** and **C4**. Correct this now.



17. Next, cell **G5** is a copy of **F5**. Correct this now.

Note: It is important to perform simple visual inspections on your spreadsheets to check that amounts tally and that the results of formulas are as expected.

18. The cumulative total in cell **G5** now matches the final total in **H4**, which is correct.
19. However, the value in **E4** does not make sense. You cannot have **-100** visitors. *Zak* informs you that this should have been **100**, so correct the error now. The spreadsheet is now complete and correct.

First Half Cumulative Totals								
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Total	Average per month
Number of Haunted Castle visitors	200	300	400	100	150	500	1650	275
Cumulative Total	200	500	900	1000	1150	1650		

Note: A useful feature of *Excel* is the **Error Checking** facility on the **Formulas** tab. This steps you through each error in a spreadsheet one at a time.

20. Save the workbook as **final totals** and close it.

4.14 Relative and Absolute Addressing

Normally the cell references that you use in your formulas are known as **relative** cell references; they can change depending on the position of the cell containing the formula. For example, if you copy the formula **B2+B3** in column **B** to column **C** it automatically becomes **C2+C3**.

However, you may sometimes wish to use a fixed cell address in a formula in order to refer to the same cell when the formula is copied. These are called **absolute** cell references. To make a cell reference **absolute**, you must use the **\$** symbol.

Activity:

1. Start a new, blank workbook.
2. In cell **B2** enter **7** and in **B3** enter **8**. In cell **B4** create enter the formula **=B2+B3** to add the two numbers together.
3. Select cell **B4** and click the **Copy** button, . Move to cell **D8** and click **Paste**. The formula is copied and is automatically adjusted to reference the two cells directly above.
4. The result **0** is displayed. Enter **5** and **3** into cells **D6** and **D7** and the result is updated.

	A	B	C	D
1				
2		7		
3		8		
4		15		
5				
6				5
7				3
8				8

Note: The cell reference in **B4** is “relative” as it is automatically adjusted when copied elsewhere (in this instance, to cell **D8**). All formulas copied so far have been relative, whether using copy and paste or the **Fill Handle**. In fact, relative cell referencing is the default and most common way to reference cells in *Excel*.

5. Copy the formula in **D8** to **E8** and **F8**. Examine the copied formulas; these too have been automatically adjusted so that cell references are *relative* to their new location.
6. Close this workbook without saving.
7. Next, open the workbook **Parts** which contains the start of a tax calculation.
8. Select cell **C6** and enter the formula for **VAT (Price multiplied by VAT Rate)**.



The screenshot shows the Excel formula bar with the formula `=C5*B15` entered.

9. The result shown in cell **C6** is **£799.58**.
10. Select **B15** and enter the **VAT Rate** of **20%** (you can enter this as **0.20** or **20.0%**). Notice that the result in **C6** is updated.
11. Use the **Fill Handle** to copy the formula in **C6** to both **D6** and **E6**. The resulting **VAT** is zero.

	£4,569.00	£6,408.00	£7,834.00
	£913.80	£0.00	£0.00

12. Check the formulas in **D6** and **E6** to find the problem. It has been caused by relative addressing. The **VAT Rate** is in a fixed location but the formulas have been automatically adjusted to reference cells that are empty, e.g. the cells **C15** and **D15**.
13. In cell **C6**, enter the formula `=C5*B15`. The **\$** symbols fix the row and column reference as absolute.



The screenshot shows the Excel formula bar with the formula `=C5*B15` entered.

Note: If pointing and clicking on cell **B15**, pressing the function key **<F4>** automatically changes any formula references to absolute.

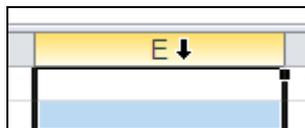
14. Use the **Fill Handle** to copy the formula in **C6** to both **D6** and **E6** again (overwriting the current contents). Check the formulas in **D6** and **E6** to see that they both refer to **B15**.
15. Complete the **Total Price** row by adding the **Price** and **VAT** together for each month. Cell **F7** should contain the final overall total **£22,573.20**.
16. Save the workbook as **parts complete** and close it.

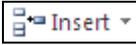
4.15 Inserting Rows and Columns

When developing spreadsheets you will often need to create a new row or column within your data. Instead of starting again, rows or columns can simply be inserted. Columns are inserted to the left of the active cell and rows are inserted above.

Activity:

1. Open the workbook **visitors** that you saved earlier.
2. **The Viper**, an old ride that has recently been refurbished, is to be added to the statistics. Select all of column **E** by clicking the **Heading Bar** column title.



3. Click the **Insert** button, , in the **Cells** group on the **Home** tab. The **House of Wax** column is promoted to column **F** and a new column **E** is inserted.
4. Enter the label **The Viper** in cell **E4**. By default, the formatting is the same as the column to the left.

Note: Notice that the formulas in column **G** have been automatically adjusted to include the new column. It is important to check that any formulas in your spreadsheets are correct after inserting new rows or columns.

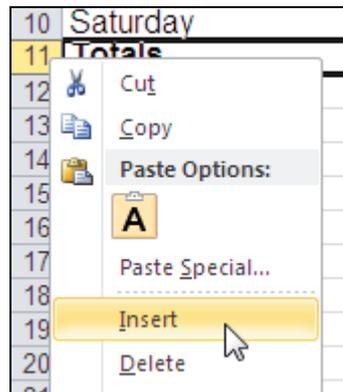
5. Enter the attendance figures in column **E** as: **4000, 2500, 3000, 2800, 4200** and **5100**. The totals in column **G** are adjusted to include the new numbers.
6. Copy the formula from **D11** to **E11**. As the formula in **D11** contains relative cell references, they are automatically adjusted when copied to cell **E11**.

The Viper	
	4000
	2500
	3000
	2800
	4200
	5100
	21600

7. **Sunday** attendances also need to be included in the statistics. As an alternative to the **Insert** button, right click on row heading **11** to display a shortcut menu.

Note: This shortcut menu approach can also be used to insert columns.

- From the options available, select **Insert**. Row **11** is promoted to row **12** and a new row **11** is inserted. By default the formatting is the same as the row above.



- Enter **Sunday** in cell **A11** and enter the **Sunday** figures across the new row as: **2000, 4000, 1500, 3000** and **2000**.
- The formula in **G11** should be automatically inserted (if not copy the formula from **G10**).
- Check the formula in cell **G11** has been copied from the row above and that the cell references have been adjusted correctly (**=SUM(B11:F11)**).

Note: Cells can also be inserted at the location of the active cell (or range). By default, any existing data within or below the active cell will be moved down.

- Save the workbook and leave it open for the next exercise.

4.16 Deleting Rows and Columns

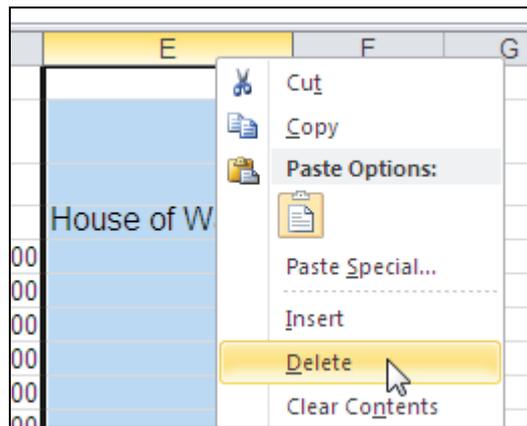
Rows and columns can also be deleted easily if they are no longer required. The rows or columns immediately afterwards are then moved along to fill the space.

Activity:

- The workbook **visitors** should still be open. *Zak* informs you that you no longer need to include the **Tower of Terror** and **House of Wax** columns.
- Select the entire **Tower of Terror** column by clicking the **Heading Bar** for column **D**.
- Click the **Delete** button,  **Delete**, in the **Cells** group on the **Home** tab. The **Tower of Terror** column is removed and the remaining columns move left to fill the space.

Note: It is important to check that any formulas in your spreadsheets are correct after deleting rows or columns.

- Right click on the **House of Wax** column header and select **Delete**.



5. The column is removed. Zak has also informed you that the row for **Sunday** is not needed any longer. Select all of row **11**.
6. From the **Cells** group, click **Delete**. The row is deleted.

Note: Cells containing formulas can be altered by deleting parts of a worksheet, resulting in **#REF** error values. In this case your formulas will need to be manually adjusted.

7. Save the workbook using the same file name and close it.
8. Open the workbook **train cars updated** that you saved earlier. Using whichever method you prefer, delete row **9** to tidy up the spreadsheet. Zak also informs you that column **D** is no longer needed; delete this column.

Note: Entire rows and columns can be cut, copied and pasted. Copied rows and columns can also be inserted between others rows and columns.

9. Save the workbook using the same file name and close it.

4.17 Formatting Text

Formatting text can improve a spreadsheet's appearance and make it easier to read and use. Cell contents in a spreadsheet can be emphasised using bold, italic and underline, as well as changing the font type, size and colour.

Note: Used properly, basic text formatting can highlight important information and give your spreadsheets a more professional appearance. However, too many different fonts and colours will often have the reverse affect.

Activity:

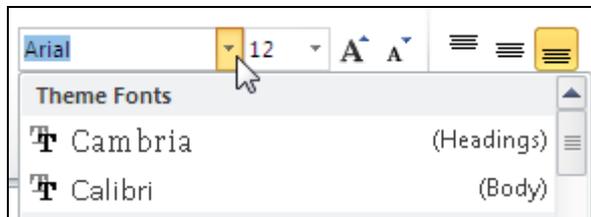
1. Open the workbook **visitors** and select cell **B4**. To make the text in the selected cell bold, click the **Bold** button, **B**, in the **Font** group.

- Click the **Italic** button, , and then the **Underline** button, , to italicise and underline the text.

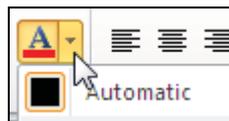
Haunted Castle Attraction Attendances			
	Haunted Vault	The Black Hole	The Viper
Monday	2000	5000	
Tuesday	2200	5500	

Note: A range of selected cells can be formatted at the same time.

- To change the font type, click the drop-down button on the **Font** box.



- Select **Calibri** from the list.
- The font size can be changed also by clicking the drop-down arrow on the **Font Size** box. Select cell **A2** and change the font size to **16 pt**. Change the **Font** again to **Calibri**.
- Another useful feature to make text stand out in spreadsheets is font colour. With **A2** still active, click on the **Font Color** drop-down arrow.



- Move your mouse pointer over any colour in the palette to see the change automatically previewed on the spreadsheet. Finally click a dark blue colour to select it.

Note: To copy the text formatting in a cell, the **Format Painter** tool can be used.

- Select cell **B4** again. From the **Clipboard** group, click the **Format Painter** button, . Then move your mouse pointer over cell **C4**. Notice the mouse pointer changes to the **Format Painter** cursor, .
- Click once to copy the formatting in cell **B4** to **C4**. Notice that the text content itself is not changed. Use the same technique to copy the formatting of cell **C4** to **D4**.

Note: You can also select a *range* of cells to apply the **Format Painter** tool to.

Haunted Castle Attraction Attendances			
	<i>Haunted Vault</i>	<i>The Black Hole</i>	<i>The Viper</i>
Monday	2000	5000	4000

Note: The useful **Format Painter** tool is also available in other *Office* applications.

10. Insert an empty row above row **11** to separate the attendance data from the final totals. This spreadsheet now looks a lot more professional.
11. Save the workbook using the same file name and close it.

4.18 Cell Alignment

Alignment refers to the positioning of text or numbers within a cell. Content can be aligned to any side of a cell and can even be rotated to any angle you like.

	A	B
1	Product List	
2		

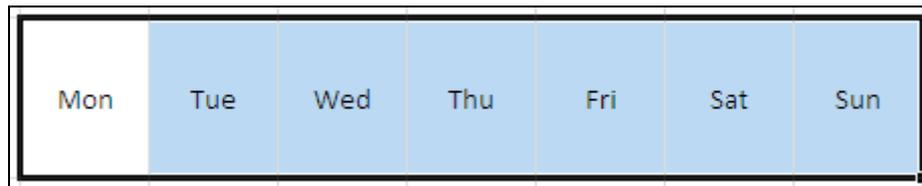
Activity:

1. Open the workbook **maintenance** that you saved earlier and select the range **B3:H3**.

Mon	Tue	Wed	Thu	Fri	Sat	Sun
-----	-----	-----	-----	-----	-----	-----

Note: Cell alignment is set by clicking one of the alignment buttons in the **Alignment** group on the **Home** tab.

2. Click the **Center** button, , to centre the labels horizontally. Click the **Align Text Right** button, , and the labels are moved to the right.
3. Increase the height of row **3** to **60**. Notice that the contents are aligned to the bottom of the cell.
4. Click the **Middle Align** button, , to centre the labels vertically. Click the **Center** button again, , to centre the labels horizontally.

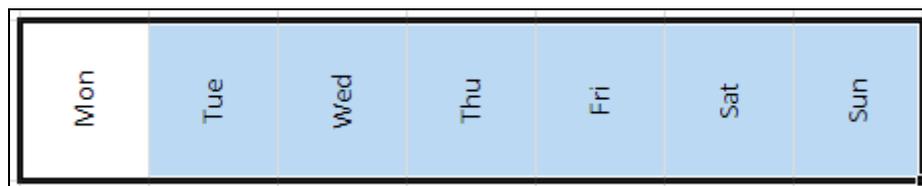


Note: Similar to *Microsoft Word*, you can also **Indent** the contents of cells using the **Increase Indent** button, , and **Decrease Indent** button, .

- Click the **Orientation** button, . From the drop-down list that appears, select **Angle Counterclockwise**. The text is rotated 45 degrees.



- Click the **Orientation** button again and select **Rotate Text Up**. The text is rotated 90 degrees.



Note: Rotated text is useful where cell widths are small. For more control over alignment, including merging cells and text wrapping, use the **Alignment** dialog box launcher.

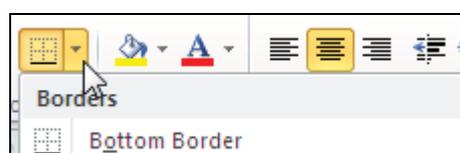
- Save the workbook and leave it open for the next exercise.

4.19 Borders and Shading

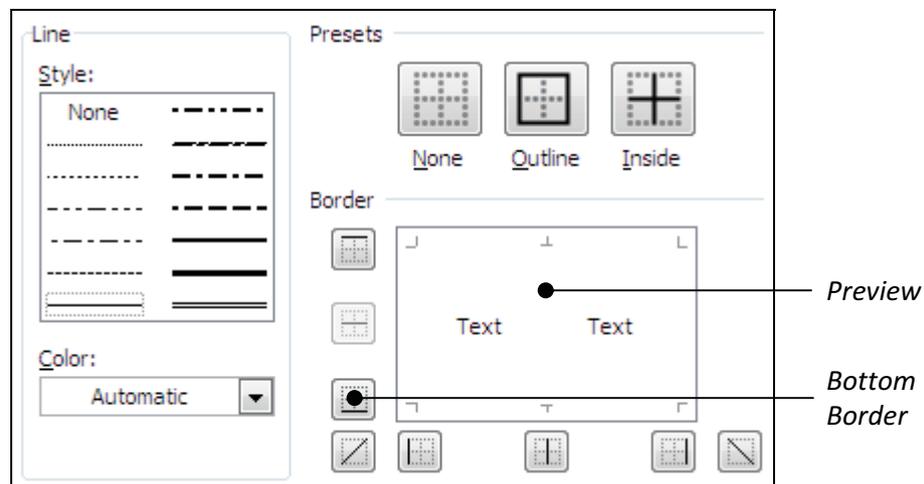
Borders are lines around the edges of cells. You can control the style and colour of lines used, and **shading** can be applied to add a background colour or pattern.

Activity:

- Using the workbook **maintenance**, make sure the range **B3:H3** is still selected. Click on the **Borders** drop-down arrow in the **Font** group (not the icon button).



2. Select **All Borders** to add lines around and between the cells in the selected range. Click away from the selected range to view the results.
3. Click **Undo**, , to remove the border. Then select the range **B3:H3** again.
4. Drop the **Borders** button and select **More Borders**. The **Format Cells** dialog box appears.



Note: You must select a **Line Style** and **Color** before adding a border.

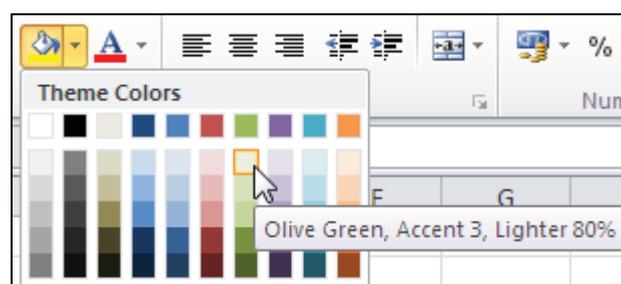
5. To apply a simple single border to the bottom of the selected row, click the **Bottom Border** button in the **Border** area. A line appears along the bottom of the **Preview** pane.

Note: Notice the many line styles available under **Style**. The three **Presets** buttons can also be used to apply borders around and between cells quickly.

6. To apply the new border click **OK**. Click away from the selected range to view the results.

Note: Borders can often be better seen if the worksheet's gridlines are hidden. To do this, select the **View** tab and uncheck **Gridlines** in the **Show** group. Be sure to check **Gridlines** again before continuing.

7. Shading is added to cell backgrounds using the **Fill Color** button in the **Font** group on the **Home** tab. Select the range **B3:H3** again.
8. Click the drop-down arrow on the **Fill Color** button, , and select a light green colour.



Note: It is often best to use light colours in cell backgrounds; too much colour can overpower the text and make it difficult to read.

9. Apply the same light green colour to the range **A4:A8** and apply a single black border on the right. The spreadsheet should look like that shown below.

	A	B	C	D	E	F	G	H	I
1	Maintenance checks week 7								
2									
		Mon	Tue	Wed	Thu	Fri	Sat	Sun	
3	Staff								Total
4	Aaron	16	22	9	17	20			84
5	Adya	21	16	19	15			12	83
6	Jack		19	15	14	17	11		76
7	Sun			18	32	21	12	10	93
8	Zak	12	16			24	14	11	77
9	Total	49	73	61	78	82	37	33	

Note: You can reapply the most recent fill colour by clicking the **Fill Color** button.

10. Save the workbook and close it.

4.20 Formatting Numbers

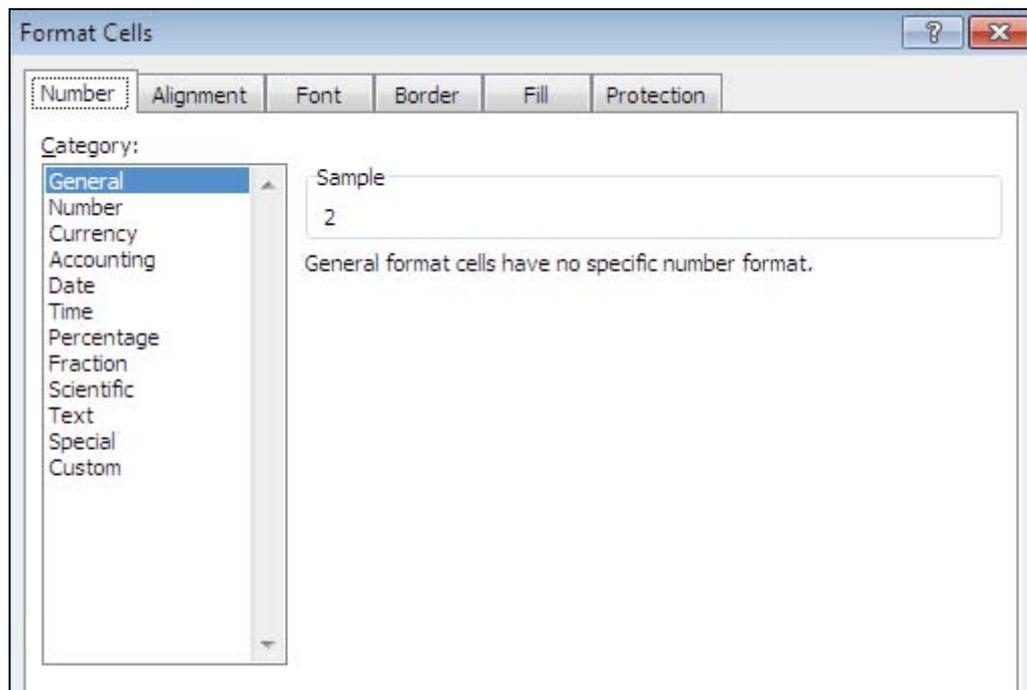
Numbers can be formatted so that they are displayed in a variety of different ways, such as currency, percentages, fractions, etc. The most useful number formats available include:

General	No specific number format
Number	Plain number formats
Currency	Currency symbols and decimal places
Date	Various date formats
Time	Various time formats
Percentage	A value as a fraction of 100 (followed by %)
Fraction	Decimals expressed as fractions
Text	Text rather than a number (useful for labels)
Special	Telephone numbers, postcodes, etc.
Custom	Custom formats that you can design yourself

Activity:

1. Open the workbook **Time**. This is a simple timesheet that *Zak* has created for recording overtime, but many of the cells do not use the correct number format.
2. The **Hours Worked** cells should be displayed to one decimal place. Select the range **E10:E15**. From the **Cells** group on the **Home** tab, click the **Format** button, .

- From the drop-down menu that appears, select **Format Cells**. The **Format Cells** dialog box appears. Make sure the **Number** tab is displayed.



- Click on each of the different types of number format shown in the **Category** list to see the various types and options available. Finally, select **Number**.
- Check that the number of **Decimal places** is **1**.



Note: Notice the **Sample** preview box. This shows the results of the chosen format if it was applied to the first number in the selected range.

- Click **OK** to apply the chosen format. All the numbers in the selected range are now formatted to one decimal place.

Note: There are buttons in the **Number** group on the **Ribbon** to **Increase Decimal** places, , and **Decrease Decimal** places, . This is done one decimal place at a time.

- Select the range **F10:F15**. Click the **Format** drop-down button and select **Format Cells** to display the **Format Cells** dialog box. This time select **Currency** from the **Category** list.
- Make sure that **Decimal places** is set to **2**, and then select **£** from the **Symbol** drop-down box. A preview is provided in the **Sample** box again.

9. Click **OK** to apply the chosen format. All the numbers in the selected range are now formatted to two decimal places and appear with a **£** symbol.

Note: The **Number Format** drop-down menu in the **Number** group can be used to select new number formats quickly.

10. Apply the number format **Number** (to one decimal place) to cell **D17**. Then apply the currency format with a **£** symbol to cells **D19** and **D21** (to two decimal places).

Note: When adjusting number formats, it is important to realise that the value in each cell is not changed. It is simply displayed in a different way.

11. With cell **D21** selected, notice that the **Formula Bar** says **10**, but the contents of the cell are displayed as **£10.00**.
12. Overtyping the contents of cell **D21** with **9.50**. Press **<Enter>** and the value is automatically formatted as **£9.50**.

Note: If cells display **#####** this means that the cell content is too big for the cell to display. Widening the effected columns will solve this problem.

13. Save the workbook as **timesheet** and leave it open for the next exercise.

4.21 Date and Time

In *Excel*, the date and time are stored as simple numbers that can be formatted to appear however you like. For example, the date is stored as a large number that represents the number of days since **1 January 1900**; however, this can be formatted so that it appears in a more recognisable form (e.g. **21 April 2011**).

Activity:

- Using the workbook **timesheet**, select cell **D7**.
- Enter today's date in the form **dd/mm/yyyy**. Press **<Enter>**.

Today's Date:	21/04/2011
---------------	------------

3. Select cell **D7** again. Notice in the **Number Format** drop-down menu that **Date** has been automatically selected by *Excel*.



4. Display the **Format Cells** dialog box. Examine each date format available within **Type**. When you are finished, select the **14 March 2001** format and click **OK**.

Note: The keyboard shortcut **<Ctrl ;>** can be used to quickly insert today's date.

5. Select cell **F21** and enter the current time in the form **HH:MM**. Press **<Enter>**.



6. Select cell **F21** again. Display the **Format Cells** dialog box and select **Time** in the **Category** list. Examine each time format available within **Type**.
7. When you are finished, select the format **13:30:55** and click **OK**.

Note: The keyboard shortcut **<Ctrl Shift ;>** can be used to quickly insert the current time.

Haunted Castle - Daily Overtime			
Name:	Zak		
Today's Date:	26 April 2011		
Attraction	Hours Worked	Pay Accrued	
The Haunted Vault	2.0	£19.00	
The Black Hole	1.0	£9.50	
The Tower of Terror	0.5	£4.75	
The House of Wax	0.0	£0.00	
Concessions	1.5	£14.25	
Other:	2.0	£19.00	
Total Hours:	7.0		
Total Overtime:	£66.50		
Hourly wage:	£9.50	Last Updated:	16:30:00

8. Save the workbook using the same file name and close it.

4.22 Charts

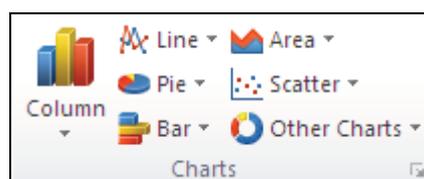
Charts are used to show numerical information in a graphical way that is clear and easy to understand. There are many charts styles available in *Excel*, but the following list includes the five most popular types:

Column	The most commonly used chart in <i>Excel</i> , this displays shaded vertical columns that represent values in different categories.	
Line	Specific values are plotted on the chart and are connected by a line. This is useful for displaying how values change over time.	
Pie	Values are shown as slices of a circular “pie”, which highlights the contribution that each value makes to the total. This is also a very common type of chart.	
Bar	Similar to a column chart, but the bars are shown horizontally across the page.	
XY Scatter	Specific values are simply plotted on the chart. Different sets of values can have different plot symbols.	

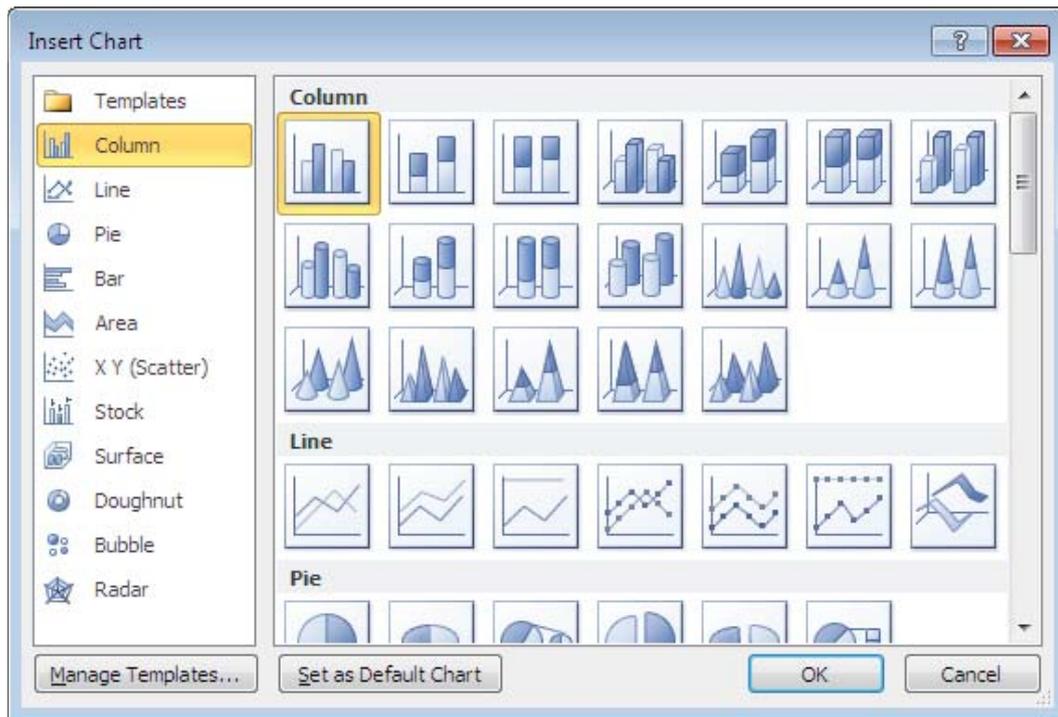
Note: There are many layouts, styles and effects that can be applied to charts. For example, different themed colours or an impressive 3D effect can be applied.

Activity:

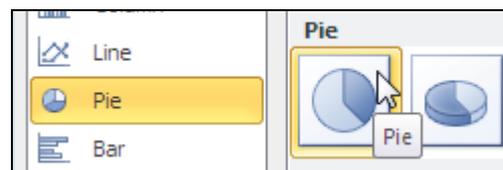
1. Open the workbook **visitors** that you saved earlier. This spreadsheet contains information that *Zak* would like to include in a presentation. However, he would rather show this data as a chart so that it is easier for others to understand.
2. Select the cell range **A4:B10**.
3. Display the **Insert** tab and locate the **Charts** group. Many popular charts can be created using the buttons shown here.



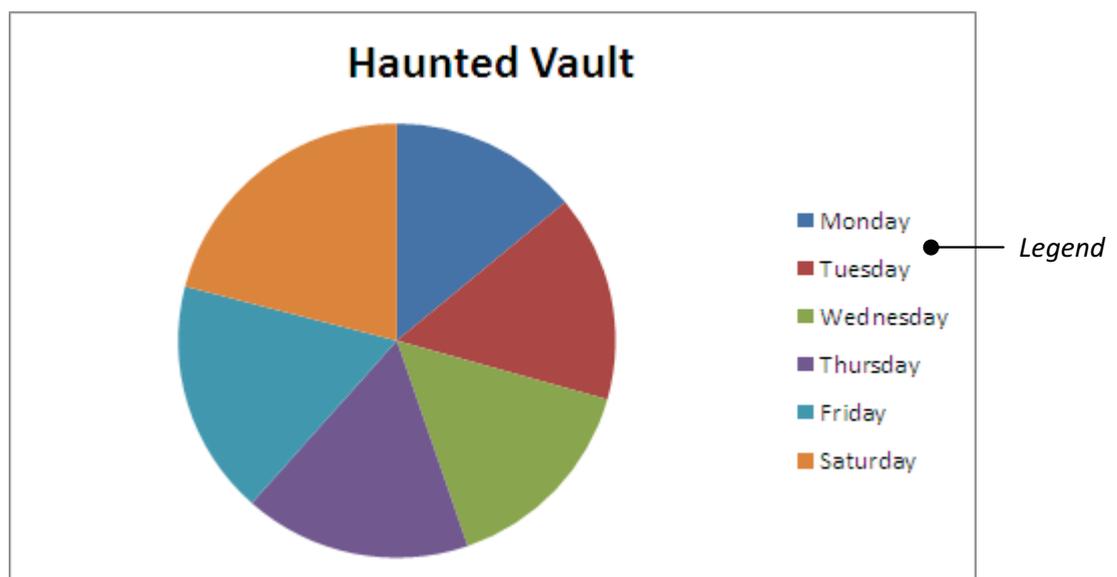
4. To see all chart types available, click the **Other Charts** drop-down button and select **All Chart Types**. The **Insert Chart** dialog box appears.



5. The **Column** category is selected by default. Select the first type of **Pie** chart instead from the list (there are many different variations of each chart to choose from).



6. Click **OK**. A simple pie chart is created from the selected data and each value is shown as a slice of the pie. A **Legend** is automatically created to describe the contents of the chart.



Note: Excel automatically obtains chart and legend titles from data labels in the range.

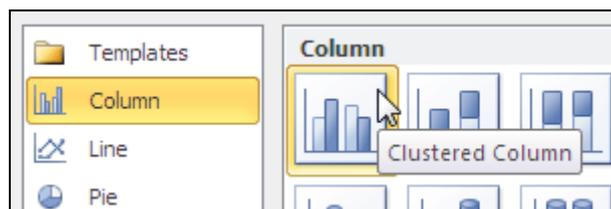
7. Notice the **Chart Layouts** group on the **Chart Tools - Design** tab. Select each layout type in turn to automatically adjust the positioning of elements on the chart.

Note: Each chart type has its own list of chart layouts. You can also reposition elements on a chart manually using drag and drop.

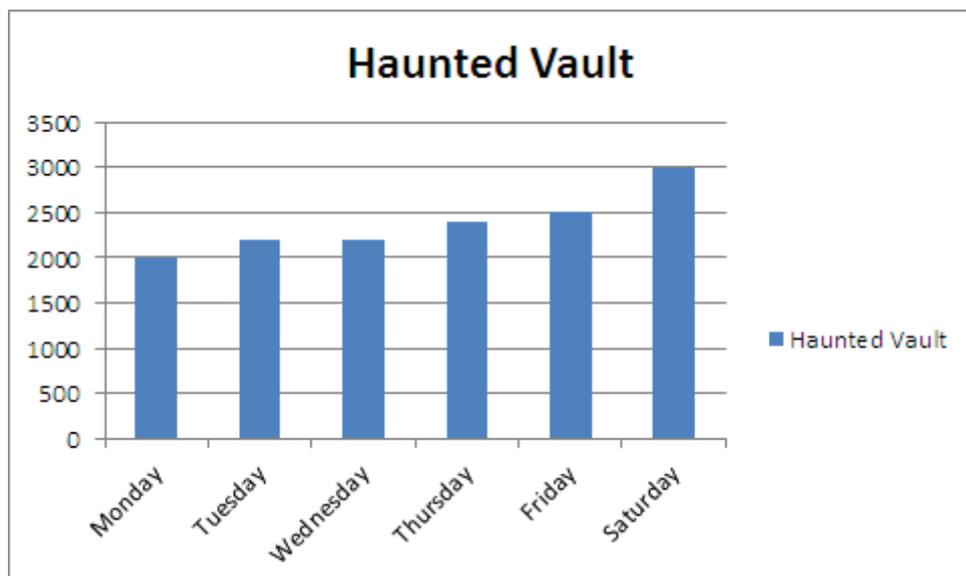
8. Locate the **Chart Styles** group on the **Design** tab. Select a variety of style types to automatically adjust the colours of the chart.

Note: More **Chart Layouts** and **Chart Styles** can be accessed by clicking the **More** button, , found towards the bottom right corner of both groups.

9. When you have finished exploring the various **Chart Styles** and **Chart Layouts** on offer, click the **Change Chart Type** button in the **Type** group on the **Design** tab.
10. Select **Column** from the list of chart types available and then select the first column chart in the list (**Clustered Column**).



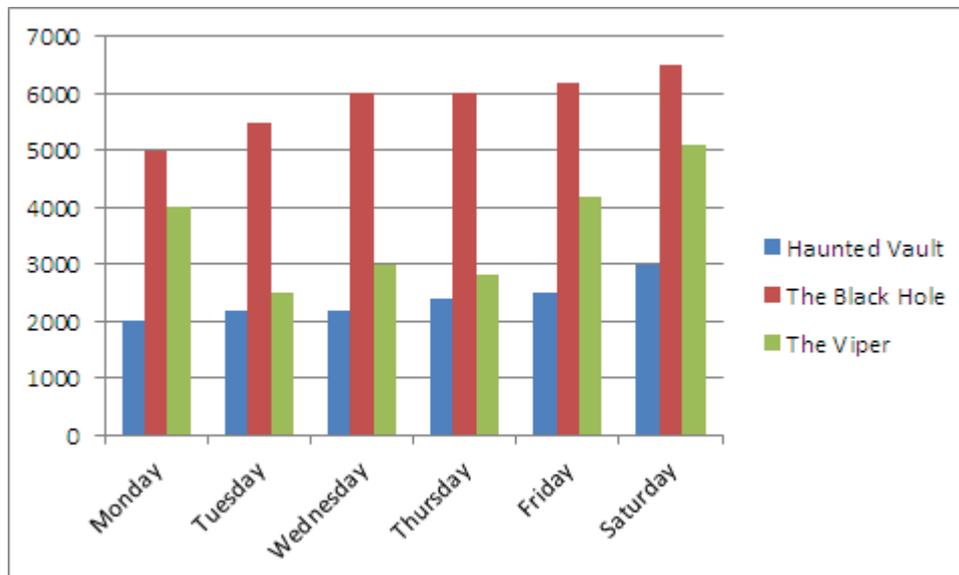
11. Click **OK**. The pie chart is replaced with a column chart.



Note: Your chart may appear differently depending on the chart styles selected earlier.

12. With the chart selected, press **<Delete>** on your keyboard to remove it.

13. Next, select the range **A4:D10**.
14. From the **Insert** tab, click the **Column** drop-down button in the **Charts** group and select the first chart type (**Clustered Column**). A column chart appears with all three rides shown as a separate bar.

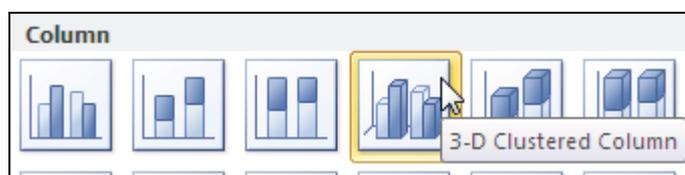


Note: As you can clearly see, **The Black Hole** ride is the most popular attraction, followed by **The Viper** and then **The Haunted Vault**. Notice how much easier it is to draw these conclusions by looking at a chart rather than the raw data.

15. Display the **Layout** tab and click **Chart Title** in the **Labels** group. From the options that appear, select **Above Chart**. Edit the chart title so that it reads **Haunted Castle Visitors**.

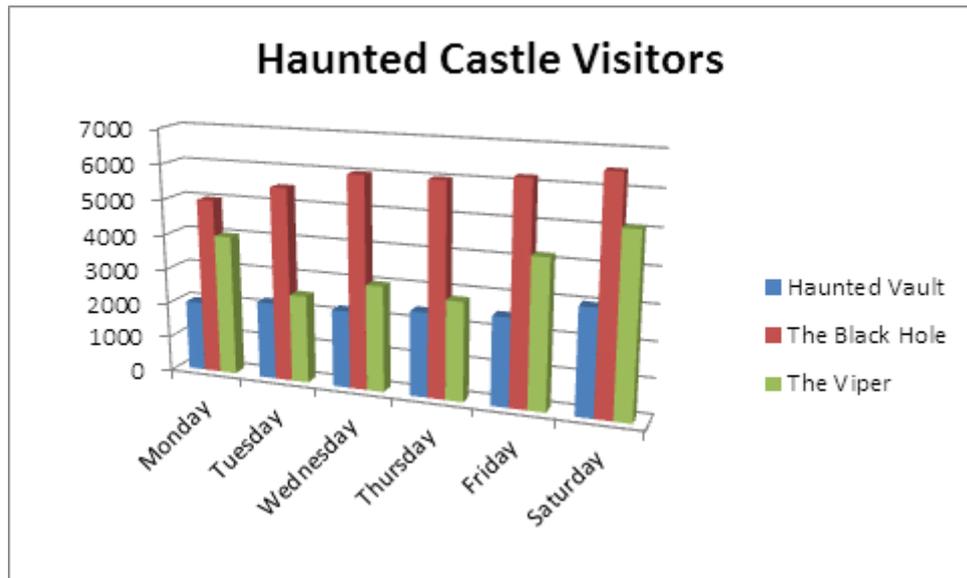
Note: Other options on the **Layout** tab allow you to add, edit and remove axis titles, gridlines, legends, and data labels.

16. Display the **Design** tab and click **Change Chart Type** again. Select the fourth column chart type on the top row (**3-D Clustered Column**).



17. Click **OK**. The chart is transformed into a three-dimensional column chart.

Note: The **Move Chart** button on the **Design** tab can be used to move a selected chart to another sheet or workbook. You can also copy and paste charts into other *Microsoft Office* applications.



18. Using cut and paste, move the chart to **Sheet2** and change the title of the worksheet's tab to **Column Chart**. Position the chart in the middle of the sheet.

Note: A chart can be manually moved or resized using the handles on the chart border.

19. Return to the **Attendances** worksheet and select the range **A4:D10** again.
20. Create a simple **Line** chart based on the selected range, and add an appropriate title of your choice. Move this chart to an empty worksheet renamed as **Line Chart**.
21. Perform the same steps to create a **Bar** and **X-Y Scatter** chart. Explore some of the other chart types and formatting options that are available.

Note: Similar to *Microsoft Word*, the **Insert** tab can also be used to insert **Pictures**, **ClipArt**, **WordArt** and **Shapes** in *Excel*.

22. When you are finished, save the workbook as **visitor charts** and close it.

4.23 Page Setup

Page Setup allows you to modify how a worksheet will look when printed. It can be in **Portrait** (upright) or **Landscape** (sideways) mode. You can also adjust **scaling** and page **margins**.

Activity:

1. Open the workbook **Events** which contains a breakdown of turnover, spending and net profits for special events at the *Haunted Castle*.
2. Display the **File** tab and click **Print**. A preview of the first page as it will be printed is shown on the right. Notice that the worksheet stretches over two pages.

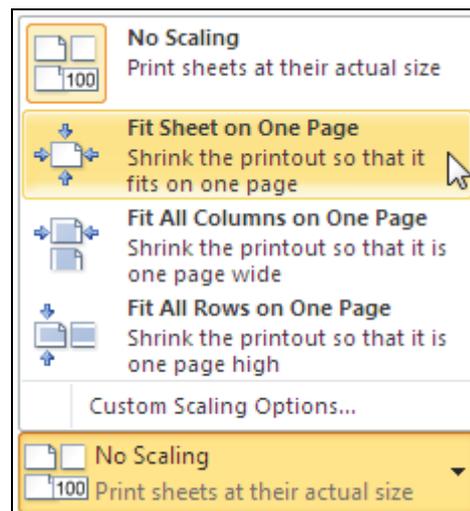
- To rotate the page so that all of the information will fit, click the **Orientation** drop-down button under **Settings**.



- Select **Landscape Orientation** from the drop-down menu and the page is rotated 90 degrees (although the contents of the workbook are not).

Note: The worksheet still covers two pages. To fit this on to one, there are two options available to you: **scale** the worksheet down on to one page or use the **Margins** tab to reduce the white space around the edges.

- Click the **Scaling** drop-down button under **Settings**. Select **Fit Sheet on One Page**.



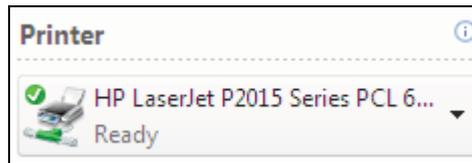
Note: The print options shown depend on your printer and may appear differently.

- The worksheet has now been scaled down a little so that it fits on to one page.
- Select **No Scaling** from the **Scaling** drop-down button to return the worksheet to its original size. Next, click the **Margins** drop-down button.



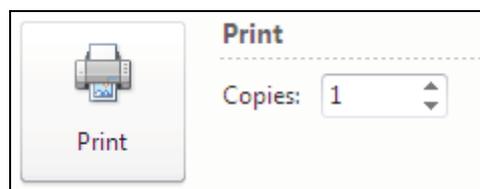
- Select **Narrow**. The margins are reduced so that the worksheet fits on one page. Restore the **Margins** to **Normal**.

9. Select an appropriate printer from the **Printer** drop-down box.



Note: In some situations you may have access to more than one printer. Try to select and use the one closest to you. Remember that you may be charged for printing.

10. Click the large **Print** button to print a copy of the current worksheet on your chosen printer. You will be automatically returned to the main worksheet view.



Note: Alternatively, click the **Home** tab to return without printing.

Note: Notice that a dotted line has appeared on the worksheet. This is called the **Print Area** and indicates the boundaries of the cell range that will be printed.

11. Select the range **B5:G9**. From the **Page Layout** tab, click the **Print Area** button in the **Page Setup** group and select **Set Print Area**. The dotted line now surrounds this range.

	23374	17980	19778	24273	26970	28768
	4000	3000	6000	8000	8000	7000
	0	0	2500	0	0	2000
	320	350	450	320	450	350

12. Display the **Print** screen and examine the print preview on the right. Notice that only the cells within the custom **Print Area** will be printed. This technique is useful for printing parts of your worksheets.

Note: **Margins, Orientation** and **Scale** settings are also available on the **Page Layout** tab.

13. Press <Esc> to return to the workbook.
14. From the **Page Layout** tab, click the **Print Area** drop-down button and select **Clear Print Area**. The custom **Print Area** is removed.
15. Save the workbook as **haunted castle events** and leave it open for the next exercise.

4.24 Headers and Footers

Headers and **footers** are lines of text at the top and bottom of every printed page. As with *Microsoft Word*, you can insert automatic **fields** such as page number, date and time.

Activity:

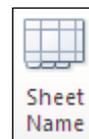
1. The workbook **haunted castle events** should still be open.
2. Display the **Insert** tab and click the **Header & Footer** button in the **Text** group.
3. The **Header** and **Footer** areas appear on the worksheet (and the **Header & Footer Tools - Design** tab appears on the **Ribbon**).



	1	2	3	4	5	6	7
	A	B	C				
	Header						
1	Haunted Castle	Jan	Feb				
2	Visitors	2600	2000				
3	Event Ticket	8.99	8.99				

Note: The **Header** and **Footer** areas contain three text boxes each: left, centre and right. Separate text can be entered in each one.

4. With the cursor flashing in the centre text box, click **Sheet Name** in the **Header & Footer Elements** group on the **Design** tab.
5. The text **&[Tab]** appears in the text box. This is known as a **Field** code and is updated automatically whenever your worksheet is opened or changed.
6. Click once in the left text box to move the cursor. Notice that the automatic **Field** in the centre box changes to **Events**. If you change the sheet name, this field will change too.



Events

7. In the **Navigation** group, click **Go to Footer**. In the left text box, type your own name.
8. Move to the centre text box and click the **Current Date** button in the **Header & Footer Elements** group to insert today's date. The field **&[Date]** appears.
9. Move to the right text box and click the **Page Number** button to insert another automatic field. The field **&[Page]** appears. Click away from the text box to see the effect.

Note: The **Header** and **Footer** drop-down buttons in the **Header & Footer** group can also be used to insert a number of predefined **field** codes.

- 10. Editing headers and footers automatically changes the worksheet view to **Page Layout**. In this view, rulers appear towards the top and left edges of the worksheet. Any margins, headers or footers can also be seen.

Note: Similar to *Microsoft Word*, you can create a different header and footer for the first page and/or for every odd and even page afterwards.

- 11. Display the **View** tab and click **Normal** in **Workbook Views**. The margins and header/footer are hidden again.
- 12. Display the **Print** screen and examine the print preview on the right. Notice the headers and footers and the updated **Fields**.

Events												
Haunted Castle	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Worship	2600	2000	2200	2700	3000	3200	2500	1500	1600	2500	6300	3000
Event Ticket	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99
Turnover	22374	17900	19773	24273	26970	28763	22475	13435	14364	22475	61132	71920
Decorations	4000	3000	6000	3000	7000	3000	4000	10000	12000	15000	14000	14000
Primitives	0	0	2500	0	0	2000	0	0	2000	3000	3000	4000
Advertising	320	350	450	320	450	350	320	400	300	230	1000	1200
Wages	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2200	3200
Overhead	2300	2500	2000	2000	2000	2000	2000	2000	2000	3000	3500	4000
Spending	9520	8250	13350	12720	12850	13750	7720	8300	16700	25630	30700	26400
Profit	13854	9730	6423	11553	14120	15013	14755	4635	-2316	-3205	30432	45520
Tax rate	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Tax	6927	4865	3214	5777	7060	7509	7378	2340	0	0	15216	22760
Net Profit	6927	4865	3214	5777	7060	7509	7378	2340	-2316	-3205	15216	22760

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- 13. Save the workbook and leave it open for the next exercise.

4.25 Display and Print Formulas

When a cell contains a formula, the result of the formula rather than the formula itself is displayed in the cell. However, it is also possible to display the formulas in a worksheet rather than their results, which is very useful when checking for errors.

Activity:

- 1. The workbook **haunted castle events** should still be open.



- To display all the formulas present in this worksheet, display the **Formulas** tab and click **Show Formulas**,  **Show Formulas**, in the **Formula Auditing** group.

Note: Alternatively, it is possible to switch between formulas and their results by pressing <Ctrl `>, i.e. **Ctrl** and the key to the left of **1** on a standard keyboard.

- The formulas are displayed and the columns are widened to accommodate all of the cell contents.

=SUM(B5:B9)	=SUM(C5:C9)	=SUM(D5:D9)
-------------	-------------	-------------

- If the formulas are to be printed, it is also a good idea to include the row and column **Heading Bars** also. Display the **Page Layout** tab and select **Print** in the **Sheet Options** group.
- Display the **Print** screen and notice that the **Heading Bars** are now also printed.
- Return to the main view and hide the formulas using the keyboard shortcut <Ctrl `>.
- Save the workbook using the same file name and leave it open for the next exercise.

4.26 Hide and Freeze Cells

When printing a workbook or showing it to others, you may find that you do not want to include particular rows or columns of data (e.g. those containing sensitive or personal information). If this is the case, it is very easy to temporarily hide them from view.

Alternatively, if you want to keep particular information on screen at all times (e.g. column and row header labels), you can freeze them in place. When scrolling through the data in a worksheet, the frozen cells will not move. An area that has been frozen in this way is known as a **Freeze Pane**.

Activity:

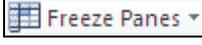
- The workbook **haunted castle events** should still be open. *Zak* informs you that rows **8**, **12** and **13** contain sensitive data that should be hidden by default.
- Select all of row **8** using the **Heading Bar**. Display the **Home** tab and click **Format** in the **Cells** group. From the drop-down menu that appears, click **Hide & Unhide | Hide Rows**.

7	Advertising	320
9	Overheads	2800

Note: Notice the thicker line between rows **7** and **9** on the row **Heading Bar**. This indicates that one or more cells have been hidden.

- Using click and drag, select rows **7** and **9** on the **Heading Bars**. From the **Format** drop-down menu click **Hide & Unhide | Unhide Rows**. Row 8 reappears.

Note: Columns can be hidden and displayed again using the same technique.

- Hide row **8** again, followed by rows **12** and **13**. Notice that none of the results have been affected (hiding rows/columns does not affect any calculations).
- Display the **View** tab and click the **Freeze Panes** button,  **Freeze Panes** in the **Window** group. From the drop-down menu that appears, select **Freeze Top Row**.
- The entire top row of the worksheet has now been frozen. Scroll down the workbook and notice that the top row remains on-screen at all times (a horizontal line marks the **Freeze Pane** boundary).
- Click the **Freeze Panes** button and select **Freeze First Column**. Scroll right and notice that the first column also remains on-screen at all times.

Note: The **Freeze Panes** option on the **Freeze Panes** drop-down button can be used to freeze an entire area of a workbook above the active cell's row and to the left of the active cell's column.

- Click the **Freeze Panes** button and select **Unfreeze Panes**. The frozen row and column are released.
- Save the workbook using the same file name and close it.

4.27 Functions

Functions are common types of formula that are built into *Excel* to help save you time. There are various types of function available, but the following are used most often:

Statistical	AVERAGE, COUNT, MAX, MIN, STDEV, VAR
Financial	NPV, FV, PMT, RATE, IRR
Logical	IF, TRUE, FALSE
Math & Trig	MOD, SIN, LOG, SQRT
Text	LEFT, RIGHT, MID, LEN
Date & Time	DATE, NOW, TIME
Lookup & Reference	HLOOKUP, VLOOKUP, CHOOSE

Activity:

- Create a new, blank worksheet.
- Starting in cell **B3**, enter a column of numbers from **1** to **10** (you can type these manually or you can use the **Fill Handle**).

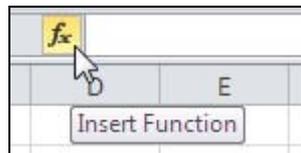
3. To add the numbers together, enter the formula **=SUM(B3:B12)** into cell **B14**. Press **<Enter>**. The result **55** appears.

11		9
12		10
13		
14		55
15		

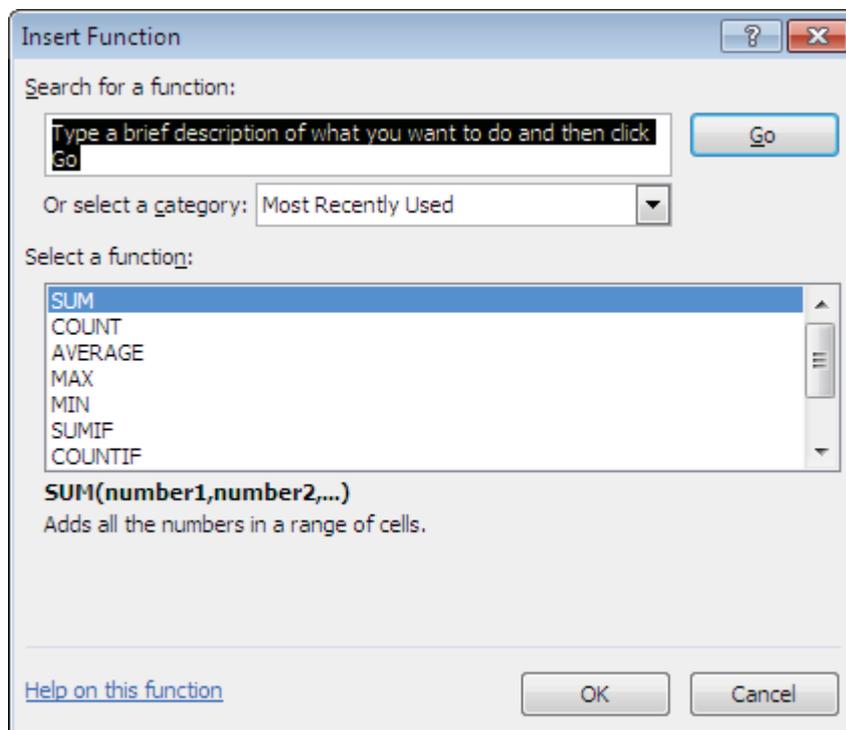
4. Move to cell **B15**. Type **=SUM(** and then use your mouse to select the range **B3:B12**. Finish the formula by pressing **<Enter>**. The result **55** appears again.

Note: It is very difficult to remember all of the functions built in to *Excel*. Luckily you don't need to – the **Insert Function** feature can be used instead.

5. Select cell **B16**. On the **Formula Bar**, click the **Insert Function** button.



6. The **Insert Function** dialog box appears.



Note: Functions can be found using the **Search for a function** text box or by selecting a category and then using the **Select a function** list.

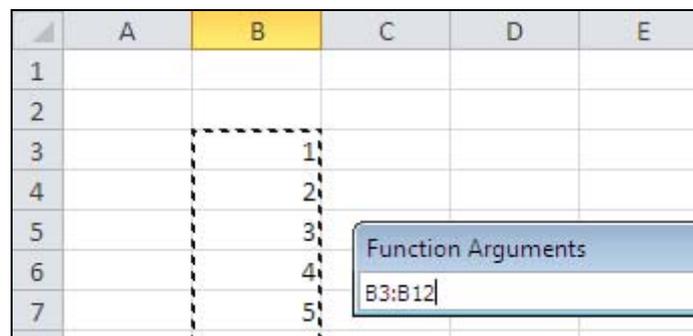
7. From the category drop-down menu, select each category in turn to see all of the available functions – there are well over 200!
8. Select the category **Math & Trig**. From the **Select a function** list, find and select the function **SUM**. Notice the brief description of the function that appears towards the bottom of the dialog box.

SUM(number1,number2,...)
Adds all the numbers in a range of cells.

9. Click **OK**. The **Function Arguments** dialog box is displayed, prompting for a range of numbers to give to the function.

Note: **Arguments** are simply the values that you give a function to work with. In the case of **SUM**, the arguments are a range of cell references containing numbers.

10. In the **Number1** box, remove the range that has been automatically found.
11. Next, click the **Collapse** button, . This hides most of the dialog box and lets you select a range in the workbook by clicking and dragging.
12. Click and drag the range **B3:B12**. The range appears in the collapsed dialog box.



13. Click the **Expand** button, , to restore the **Function Arguments** dialog box again.

Note: Notice that you can use the **SUM** function to add more than one range.

14. Click **OK**. The function is entered into the worksheet and the result is displayed.

Note: Any of *Excel's* built-in functions can be applied using this method. In the next exercise you will get to use more complex functions.

15. Use the **Insert Function** dialog box to locate some of the functions described at the start of this exercise. The brief description text that appears below each one will describe their use in more detail.
16. When you ready to move on, close the worksheet without saving.

4.28 Statistical Functions

Statistical functions deal with analysing numerical data, from simple counting to more complex averaging. The most popular statistical functions include:

COUNT	Counts cells that only have numbers in them
COUNTA	Counts cells with any content
AVERAGE	Finds the simple average of a range of cells
MAX	Finds and displays the largest number in the selected range
MIN	Finds and displays the smallest number in the range
COUNTIF	Counts numeric items that match a set condition, e.g. the number of clients that owe more than £100

Activity:

1. Open the worksheet **Numbers**.
2. How many numbers would you say there are in column **B**? To find out move to cell **A102** and type **Count**.
3. Move to cell **B102** and click the **Insert Function** button, . From the **Statistical** category, select **COUNT** and click **OK**.

Note: When using a function, *Excel* tries to automatically find cells to work with. Nearby ranges that it finds are entered into the **Function Arguments** dialog box.

4. Delete the contents of **Value1** and enter the range **B1:B100** instead. Click **OK**.
5. This result **99** is displayed; the number of cells in the range that contain numbers. Scroll up to find a missing number in the range (cell **B56**).
6. Enter **23** in the empty cell and press <Enter>. Scroll back down to the bottom of the list to see that cell **B102** now reads **100**.
7. In cell **A103** type **Average**. Move to cell **B103** and click the **Insert Function** button, .
8. From the **Statistical** category, select **AVERAGE** and click **OK**.
9. Enter the range **B1:B100** in the **Number1** box and click **OK**. This displays **50**, the average of the numbers in the specified range.

Note: When the **Average** or **Count** functions are used, cells which are blank are ignored. However, cells containing zeros are included in the calculations.

10. Move back to the top of the worksheet and in cell **D11** type **Count**. In **D12** type **CountA**.

11. In **E11**, insert a function to count the number of numeric cells in the range **E1:E9**.
12. In **E12**, use the **CountA** function to count all of the cells in the range **E1:E9**.

Count	5
CountA	8

13. In cell **A104** enter the text **Max**. Move to **B104** and insert the function **Max** from the **Statistical** group. Enter the range **B1:B100** and click **OK**. This gives the maximum value present in the specified range (**123**).
14. In cell **A105** enter **Min** and in cell **B105** enter the function **=MIN(B1:B100)**.

Note: Notice the box that appears underneath the cursor as you type a formula. This allows you to select a built-in function quickly as you type.

15. Click **OK**. This gives the smallest value (**1**).
16. Change the contents of cell **B100** to **201**. All the functions except **Count** change.

101		
102	Count	100
103	Average	52
104	Max	201
105	Min	2
106		

17. Save the workbook as **functions** and close it.

4.29 Sorting Data

Sometimes you may need to **sort** the contents of a spreadsheet so that related cells are grouped together or placed in a certain order. For example, you could rearrange the contents of a staff or product list alphabetically by name.

Activity:

1. Open the workbook **Temps**. This spreadsheet contains a list of temporary staff that have worked at the *Haunted Castle* in the past year.
2. Select any cell in column **A** that contains a name and, from the **Home** tab, click the **Sort & Filter** button in the **Editing** group. From the menu that appears, select **Sort A to Z**.

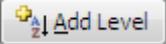


- The rows in the worksheet are reordered alphabetically using the contents of column **A**.

Note: *Excel* automatically detects the type data and its range when sorting. However, if a range is selected first, only the contents of those cells will be sorted.

- Select a cell in column **B** containing a name and, from the **Sort & Filter** button, select **Sort Z to A**. The worksheet is reordered again by **Surname** in reverse alphabetical order.
- Select a cell in column **C** containing a number and click the **Sort & Filter** button. *Excel* recognises that the content of the selected cell is a number. Select **Sort Smallest to Largest** and the worksheet is reordered by increasing **Age**.
- You can also create more complex, custom sorts. Select any cell in the range **A5:D20** and display the **Data** tab. Click the **Sort** button in the **Sort & Filter** group. The image shows the 'Sort' button in the Excel ribbon. It features a small grid icon with 'A Z' and 'Z A' in the top-left and bottom-right corners, and the word 'Sort' below it.
- The **Sort** dialog box appears. Select **Column A** from the **Sort by** box and make sure **A to Z** is selected in **Order**.

Note: If *Excel* is able to automatically detect the column headings in a worksheet, these will appear instead of **Column A**, **Column B**, and so on.

- Click **Add Level**, , to add another level to the sort. In **Then by**, select **Column B** and again make sure **A to Z** is selected in **Order**.

Note: It is very common to sort columns of data. However, if you need to sort by row instead, click the **Options** button and select the **Sort Left to Right** option.

- Click **OK** to perform the sort. The list is sorted on **First Name and then Surname**.
- Save the workbook as **temporary staff sorted** and close it.

4.30 Filtering Data

Filtering is a simple technique for selecting records that match certain conditions (these conditions are known as **criteria**). Only the records that match the criteria are displayed; records that do not match are hidden. When a list is filtered, the worksheet is said to be in **Filter Mode**.

Activity:

- Open the workbook **Research**. This spreadsheet contains the results of a recent visitor survey at the *Haunted Castle*. Select any cell in the range **A3:G3**.
- Display the **Data** tab and select **Filter** from the **Sort & Filter** group. The worksheet enters **Filter Mode** and drop-down arrows appear in the column headings in row **3**.

	A	B	C	D	E	F	G
1	<u>Survey Analysis</u>						
2							
3	Surname	First Name	Sex	DOB	Age	Town	First Visit
4	Poole	Janet	F	01/05/1998	12	Littletown	1
5	Robinson	Christopher	M	23/11/1985	25	Noplace	1

Note: Excel automatically detects headers and then fills each drop-down filter list with values that can be found in that column.

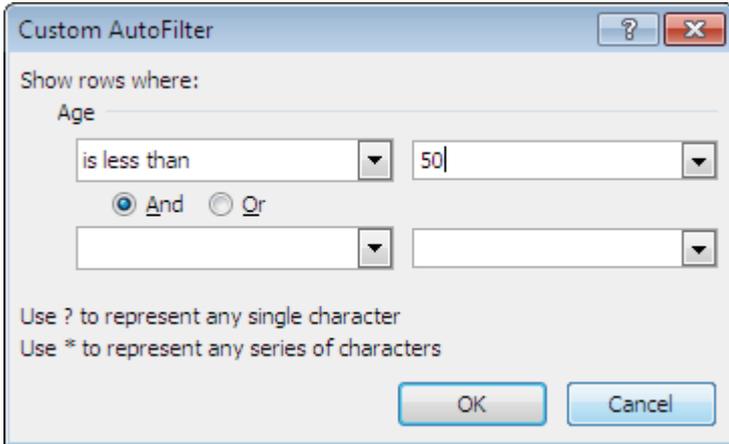
- Click the **Town** drop-down filter arrow, uncheck **Select All**, and click to select **Littletown**. Click **OK** and only the people from **Littletown** are displayed.
- Using the **Town** filter arrow again, click **Select All** and **OK** to show the entire list.
- To display all the males from **Noplace** who were visiting the park for the first time, select only **M** from **Sex**, **Noplace** from **Town**, and **1** from **First Visit**.

Note: The drop-down arrows gain a filter symbol, , if the column is currently filtered.

- To redisplay the whole list quickly, click the **Filter** button on the **Ribbon** to exit **Filter Mode**. The worksheet returns to its normal state.

Note: You can also apply custom search criteria for even more advanced filtering.

- To only display visitors who are less than 50 years old, enter **Filter Mode** again and select **Number Filters** from the **Age** drop-down list.
- Select **Less Than** from the submenu that appears and type **50** in the information box.



- Click **OK** to filter the list. Only visitors under 50 years old are now displayed.

Note: The number of records found, **151 out of 220**, is shown on the **Status Bar**.

10. To restore the list, click on the **Age** field drop-down. Then click **Select All** and **OK**.
11. Next, create a new filter to show only those people surveyed who are **50** years or *older*. You should locate **69** records.
12. Restore the full list and then create another filter to show only those people whose **Surname** begins with **B**. You should locate **22** records.
13. Restore the full list and then create another filter to show only those people who were born between **01/04/1979** and **01/04/1989** (**11** records). How many of these people were visiting the park for the first time? You should find only **2** records.

Note: Other useful filters include **Top 10**, **Above Average**, **Below Average**, and a wide variety of date criteria. You can also create your own **Custom Filters**.

14. Close the workbook without saving.

4.31 Importing Data

Data can be imported into an *Excel* worksheet from a variety of external sources. In practice, however, it's usually far simpler to only import data contained in plain text files.

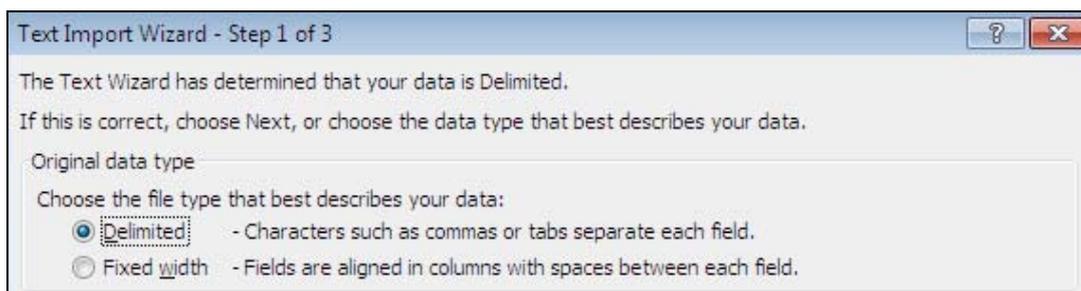
Text files must contain information separated (or **delimited**) by single characters such as tabs, spaces, or much more commonly, commas.

Activity:

1. Start a new, blank workbook. Display the **Data** tab and, from the **Get External Data** group, click **From Text**. The **Import Text File** dialog box appears.
2. Locate the data files folder for this section and import the file **Concession**.

Note: The plain text file **Concession** is known as a **Comma Separated Values** file (.csv). Each value on a row is separated by a comma.

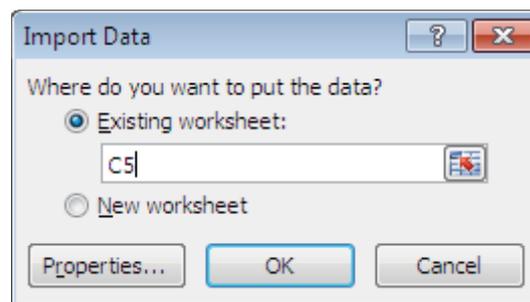
3. The **Text Import Wizard** appears. Notice that *Excel* has already recognised that the file contains data separated by characters.



4. Click **Next** to move to **Step 2** of the wizard. Notice the **Data preview** at the bottom of the dialog box – this shows you the contents of the file that you are importing.
5. **Tab** is selected as the character which separates values. Change this to **Comma** and notice the effect in the **Data preview**.

Concession Sales	Popcorn	Drinks	Ice Cream	Candy Floss	Smoothies
Black Hole	23.45	340.59	450.45	101.34	34.67
House of Wax	29	609.34	670.98	340.56	56.89
Haunted Vault	134	67	456	2786.9	9.45

6. Click **Next**. The final screen of the wizard allows you to select which type of cell formatting you wish to apply to the new data. **General** is usually always best, so click **Finish**.
7. The **Import Data** dialog box appears prompting you to enter a cell reference into which the imported data will be inserted. Make sure that **Existing worksheet** is selected and enter cell **C5** (in practice you can import data into any starting cell that you like)



Note: The selected cell represents the top left corner of the imported data block.

8. Click **OK** and the data is imported. Each value that was separated by a comma in the original file is placed in its own cell.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5			Concession Sales					
6				Popcorn	Drinks	Ice Cream	Candy Floss	Smoothies
7			Black Hole	23.45	340.59	450.45	101.34	34.67
8			House of Wax	29	609.34	670.98	340.56	56.89
9			Haunted Vault	134	67	456	2786.9	9.45
10			Tower of Terror	34.56	59	310	34.56	9.99
11			Viper	49.09	45.56	50	53.6	109.45

9. Save the workbook as **imported data** and close it.
10. Close *Excel*.

4.32 Next Steps

Well done! You have now completed all of the exercises in this section. If you feel you are ready to test your knowledge and understanding of the topics covered, move on to the following **Develop Your Skills** activities. If there are any features of *Microsoft Excel* that you are unsure about, you should revisit the appropriate exercises and try them again before moving on.

If you are interested in exploring some of *Microsoft Excel's* more powerful features, why don't you use the Internet to find out a little more about the following advanced topics.

Feature	Description
Templates	<i>Excel's</i> workbook templates work in generally the same way as <i>Word's</i> document templates. Any normal workbook can be saved as a template, allowing you to create a standard layout that can be used as a basis for future spreadsheets.
Formatting	<i>Excel</i> is capable of automatically formatting cells depending on their contents. This means that critical values which reach a specific value or level can be highlighted so that they stand out. This is called Conditional Formatting .
Goal Seek	Goal Seek allows you to perform "What If?" calculations on a worksheet. It can be used to help answer questions such as "What price do I charge to make a profit?" and "How many items do I need to sell to break even?"
Charts	There are many chart types available in <i>Excel</i> . Build on the basic lessons learned in 4.22 and explore the various layouts and styles on offer, including <i>Excel 2010's</i> interesting new Sparklines feature.
Tracking	It is very common to have another person review and edit spreadsheets that you create. If a workbook has been set up to "track changes", any changes made to a worksheet will be recorded. Once you get the updated workbook back, you can either accept or reject each change.
PivotTables	A PivotTable is a powerful feature of <i>Excel</i> that organises and then summarises large amounts of data. In many ways it is similar to the sorting and filtering features you have already seen in this section, but it allows for much more control over how the data is displayed.
Macros	A macro records keystrokes and menu selections and then plays them back exactly as they were recorded. A macro can be created so that frequently repeated tasks can be performed automatically.

Develop Your Skills...



At the end of every section you will get the chance to complete two full tasks without my assistance. This will help to reinforce learning and develop your skills. Don't forget to use the planning and review checklists at the back of the book to organise and evaluate your work.

Note: Sample solutions for both tasks are provided in this section's data files folder.

Level 1: Haunted Castle Repair Log

In this task you will be asked to complete a simple spreadsheet for *Zak*. You will need to use the ICT skills you have learned in this section to plan, develop and present an appropriate solution. You can ask for help from friends, colleagues or a teacher if you get stuck.

Level 1 Task

My team and I often come across problems during our routine maintenance of rides. To fix these problems before a breakdown occurs, we usually need to buy and fit new parts. To allow us to keep track of spending and make sure we don't go over-budget, I plan to start keeping a monthly record of purchases in a spreadsheet.

I've made a start on creating this spreadsheet, but I need you to finish it for me. The information you will need is available in the following file:

 **Repair Log** *Zak's* incomplete repair log spreadsheet

Start by opening *Zak's* spreadsheet, and then enter the most appropriate formulas to calculate results in the following columns:

F (Item Value * Quantity), **G** (Cost * VAT Rate), and **H** (Cost + VAT)

Enter a formula in cell **B24** to *count* the number of repairs, a formula in **B26** to *sum* the items in column **D**, and a formula in **B28** to *sum* the values in column **H**.

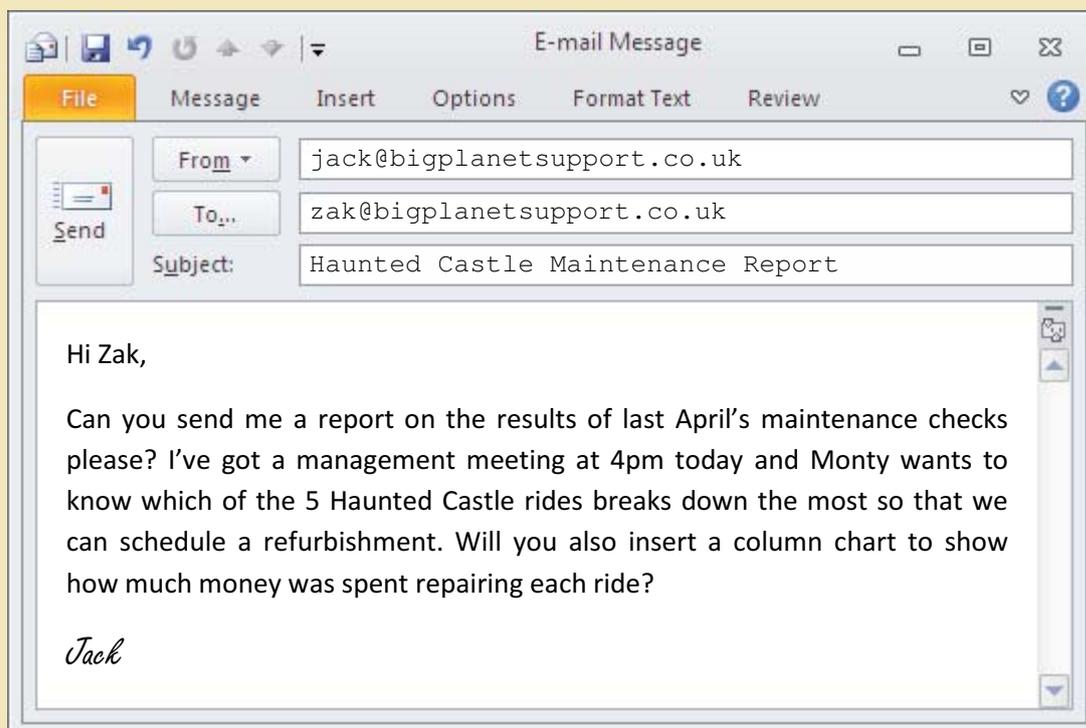
The spreadsheet also needs to look professional and be easy to read, so you should apply appropriate text and cell formatting. Add a more appropriate title to the spreadsheet so that it can be more easily identified, and then save the file as **final repair log**.

Level 2: Maintenance Report

In this task you will be asked to develop a spreadsheet and create a report for one of *Zak's* colleagues. You will need to use the advanced ICT skills that you have learned in this section to create a suitable solution (you may need to break the problem down into smaller parts first). Only level 2 students should attempt this task and it should be completed without help from others.

Level 2 Task

I've just received the following e-mail from one of my colleagues in the engineering and maintenance department.



I need to head over to *The Viper* to repair a breakdown, so will you get this information together for *Jack*? I've made a start on the report in *Microsoft Word* but I've not included any figures yet. The information you will need is available in the following files:

- * **Report** *Zak's* incomplete report document
- * **April Checks** A file containing raw maintenance data for April

Start by opening *Zak's* report to see the types of information required to complete the document. Then use the most appropriate application to work out the necessary answers and create a chart. You may need to sort and filter the data that you have been given. The spreadsheet also needs to look professional and be easy to read, so you should apply appropriate text and cell formatting. Finally, save the document as **maintenance report**.