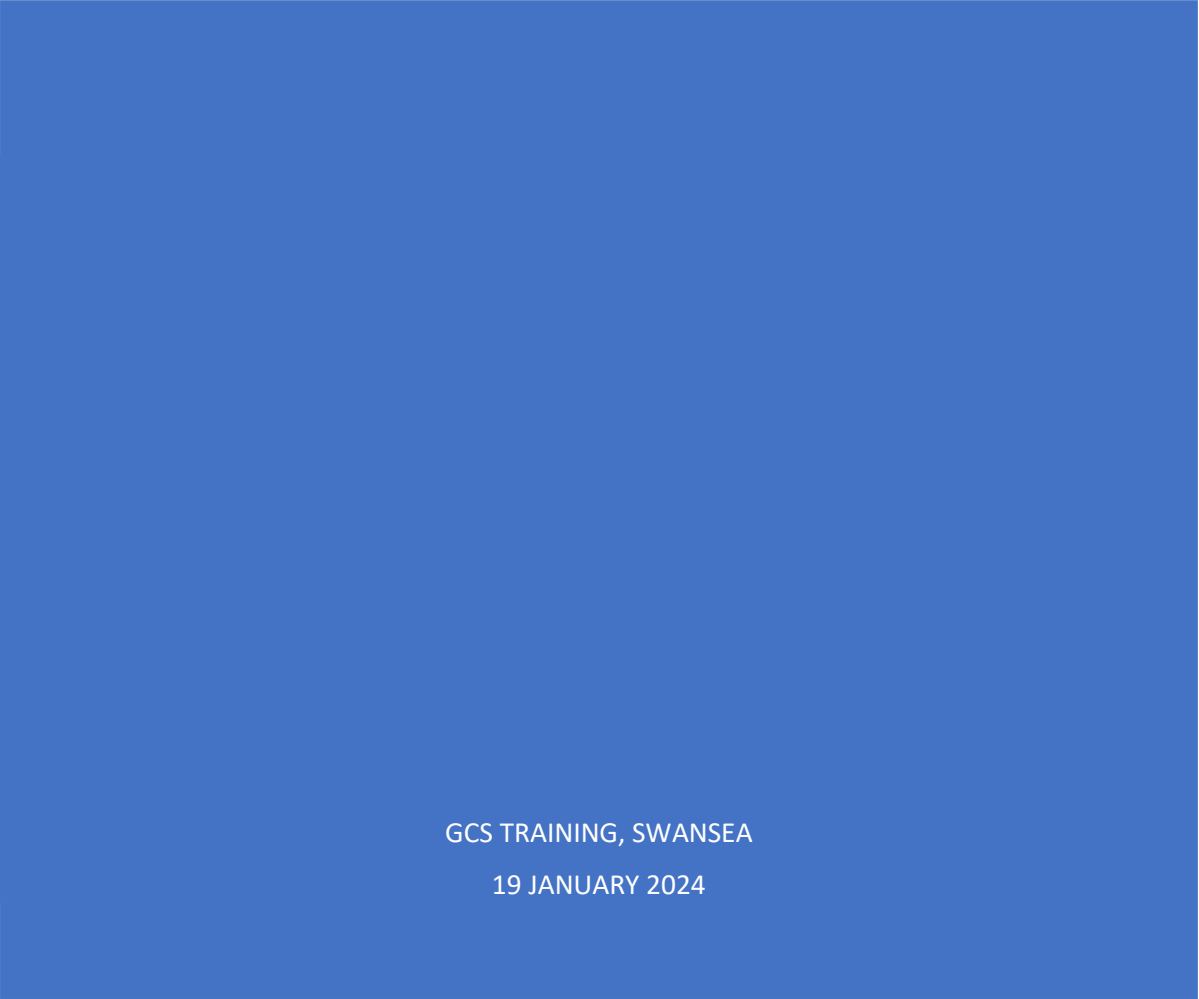




EXCEL TRAINING



GCS TRAINING, SWANSEA

19 JANUARY 2024

Overview

By successfully completing the tasks in this course, you will be able to:

- Navigate Excel
- Use formatting and conditional formatting
- Enter and edit data
- Carry out mathematical operations using formulas
- Check for, and correct, errors in layout and calculations
- Use a variety of functions
- Store and organise data
- Represent information using charts and graphs
- Create tables, sort and filter using slicers
- Create pivot tables and pivot charts
- Link data across multiple sheets
- Set up dashboards

Key terms have been emphasised in **bold**. The tutor will explain these in the sessions.

You can keep this booklet so make as many notes as you can during the sessions.

Pages 2-5 are provided to ensure you are able to navigate the keyboard, use File Explorer and navigate Excel during the session.

Depending on your initial level, you may not complete all of the tasks in the booklet, but you can take the booklet away with you to further develop your skills after the session.

The Keyboard



Most Windows computers use a **QWERTY** keyboard like the one above. Some laptops may not include the number pad that you can see on the right-hand side.

Make sure you can find the following keys:

Ctrl	Windows	Alt	Tab
Backspace	Enter	Delete	Esc

Folder Structure

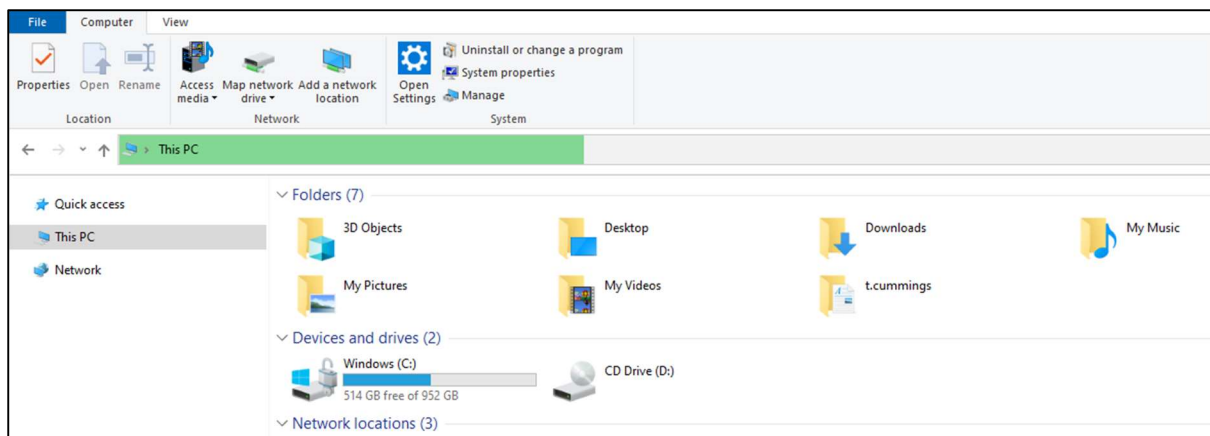
Before creating any content, it is good practice to create storage **folders**.

Folders on a computer are just like folders in a filing cabinet - they are somewhere to keep documents safe, organised, and convenient for access later.

There are many ways to create folders, but the most common method is to use **File Explorer**.

There are several ways to open File Explorer:

- Press the Windows logo key + E
- Find it from the start menu, or
- Click the folder icon in the taskbar

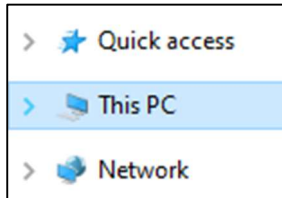


The section at the top of the screen is known as the **ribbon**. The ribbon is commonplace in a lot of applications including Windows and Office packages.

As the user moves around and selects different items, the ribbon changes quite frequently. It does this so that it only ever shows relevant tools.

Below the ribbon, on the left-hand side, is the **navigation pane**. This lists everything that makes up the system (including attached devices, internal, external, and networked storage, and folders).

Although some organisations will set things up differently, you should see **Quick access**, **This PC** and **Network**. You may need to scroll up and down to find them.

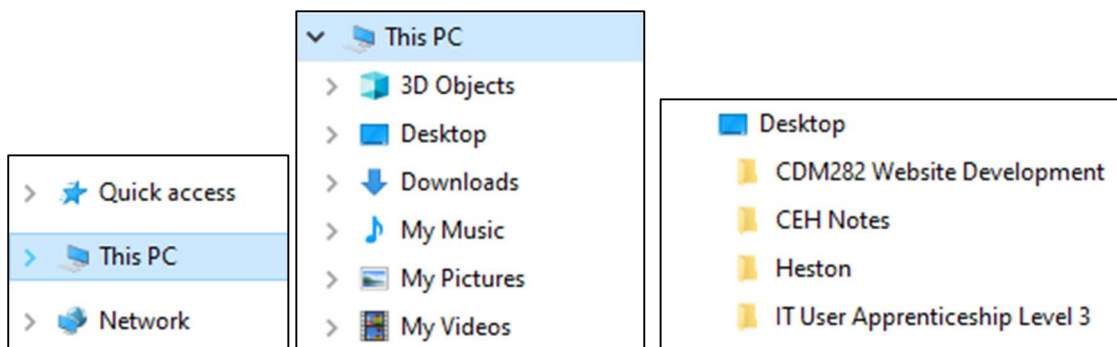


Folders with a > button to the left can be clicked and expanded.

It is common to find folders inside other folders - these are sometimes referred to as **subfolders**.

Folders that we create as users will have the traditional **yellow folder icon** by default. Folders with images are *usually* the ones that come built-in to Windows.

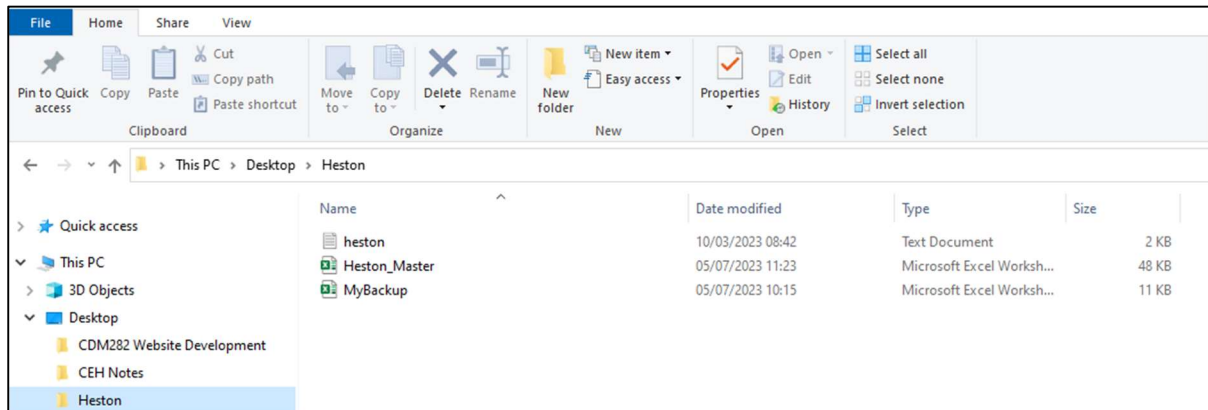
In the following example, if This PC is expanded, it contains a folder called Desktop. If Desktop is expanded, it contains a folder called Heston (among others).



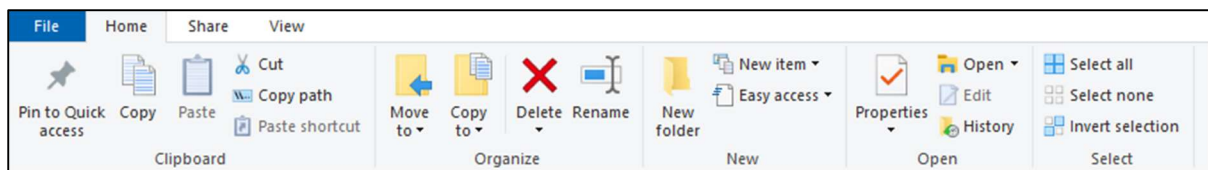
Notice that Heston doesn't have a > alongside, so we can't expand any further.

If you want to look inside a folder, you can select it in the navigation pane and a preview of what's inside will be shown in the main window to the right. You can also double click folders from the preview and use the bar above the main window (below the ribbon).

As the main window shows, the Heston folder contains a text document and a couple of Excel Worksheets. Notice how the file type is indicated by the type of icon used.



Also note how the ribbon has updated to include **New Folder** as a button/option.



Spend some time looking around and navigating from folder to folder before creating a folder called **Excel in a Day** in a suitable location. Save the workbook provided in this folder.

Notes:

Navigating Excel

Locate and open Excel.



In Excel we create **workbooks**. A workbook can contain many **sheets**.

However, it is quite common to hear the word **spreadsheets** when people refer to both of these terms.

Use the File tab in Excel to open the **Excel in a Day** workbook. You may need to enable editing.

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. [Enable Editing](#)

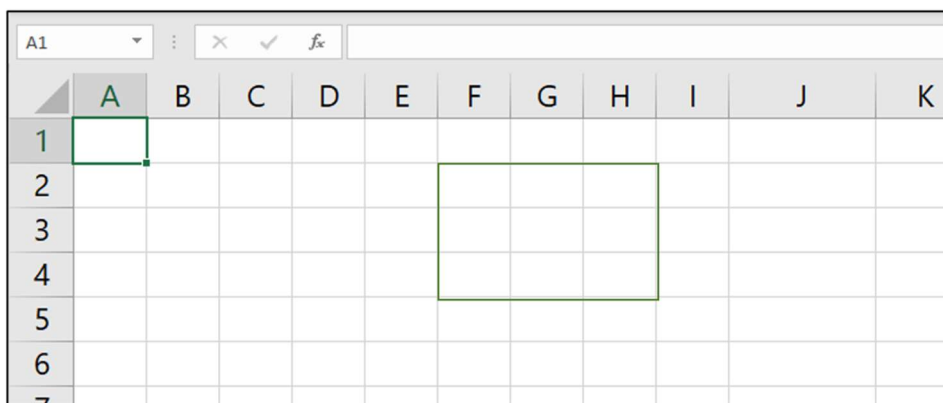
At the top, you will see tabs and a ribbon. Each tab opens a new ribbon with groups and buttons.

Objects will often have context tabs, and these will appear to the right-hand side of the default tabs. If you are not familiar with these terms, visit the Navigation section at the end of the workbook.

Below the ribbon, you will see a grid and several boxes. You can hover over the boxes to reveal their names. If the names do not show, you may need to turn on ScreenTips (File > Options > General > ScreenTip style > Show feature descriptions in ScreenTips)

Make sure you can find the following to enable navigation throughout the course.

- Name box
- Formula bar
- Column headers
- Row headers
- Cell – **what do you think might be the reference of the selected cell?**
- Cell Range – **what do you think might be the range of the selected cells?**
- The Select All button (you can also use CTRL + A)



Referencing Sheet

Cells are referenced using their column letter followed by their row number e.g., A4, B7, Z291.

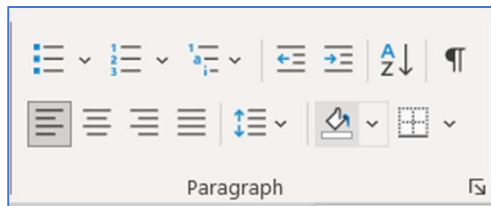
Cell Ranges are indicated by listing the first and last cell references separated by a colon (:) e.g., A1:B8, B7:C32, F6:G37.

The name box can be used to quickly see what cell is selected.

It can also be used to select cells - type a cell reference or range into the name box and press enter to see how it works.

Cells can contain text. They can also be shaded.

The shading tool is in the Paragraph group and looks like a paint pot.



The dropdown arrow next to the paint pot allows the user to select a colour. When a colour is selected, the button will be underlined with that colour. This means that if you want to use the same colour many times, you can click the button rather than selecting from the dropdown. The dropdown option will only be needed to change colour.

Use this knowledge to complete the task.

Task

Select the following cells and ranges – shade each in black

F3:H3	L3:N3		
E4	I4	K4	O4
D5:D7	J5	P5:P7	
E8	O8		
F9	N9		
G10	M10		
H11	L11		
I12	K12		
J13			

After completion, save your workbook in your Excel folder using **version control**. This means that you will add the words Draft 1, and change this to Draft 2, Draft 3, à Final, when you make subsequent saves. You could also use v1, v2, v3, à Final. This is another common way to label drafts.

Formatting Sheet

Select the Formatting sheet in your Excel workbook.

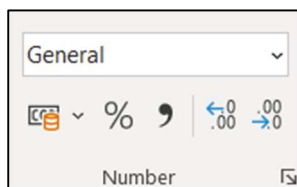
Note, in addition to changing sheets with a mouse, you can use:

CTRL +PgDn to move left to right (→) between sheets.

CTRL + PgUp to move right to left (←)between sheets

When content is added to cells, the **General** data type will be applied by default.

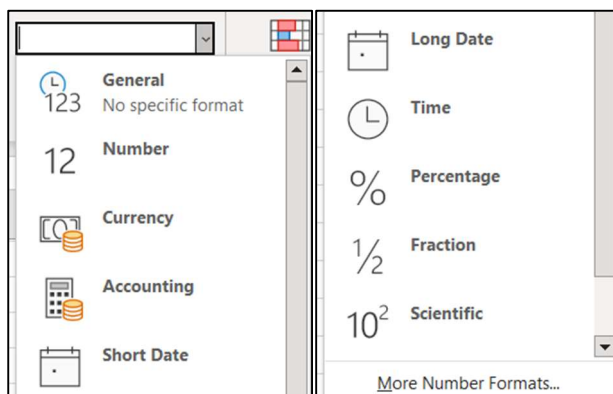
You can see this in the **Number** group of the **Home** tab.



It is possible to change data types using the dropdown. Here are the main data types you might need to use.

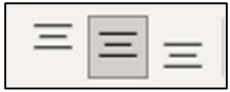
There are more if you click More Number Formats at the bottom (or click **CTRL + 1**) to open the format cell context menu.

This menu can also be opened by right-clicking on a selected cell(s).



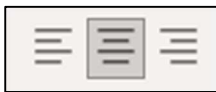
Note: Accounting and Currency formats are not the same! Can you apply them to see the differences?

When working with the **Alignment** tools, in the **Paragraph** group, the top row controls **vertical alignment**.



The buttons position the contents at the top, middle and bottom. Middle is currently selected - we can tell this from the grey outline around the button.

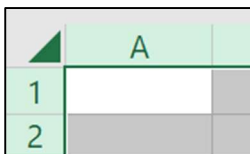
The bottom row controls the **horizontal alignment**.



Often, a combination of the two selections will be required

Column and row headers can be dragged left, right, up, and down to adjust the width of columns and the height of rows. You can also right click and provide a value (in pixels) or **double click the dividing line to autofit to the contents**.

If you click the **select all triangle** and double click the dividing line, you can autofit the contents of the entire sheet at the same time. The select all triangle will go green when clicked and the screen will darken to show it is selected. The same selection can be made with CTRL + A.



The border tool allows you to add/remove borders from selected cells and can be very useful for improving appearance. Each button here has a **toggle** action. Click once to add the border and click again to remove the border. For more advanced options such as colours and styles, you should use the **Borders and Shading** button at the bottom of the border dropdown.

Task

Format the content of column B as indicated in column A.

Resize all cells for best fit and presentation.

Select the cells with content and add All Borders.

Challenge: Use the borders and shading option to add blue, double line, borders to your formatted text.

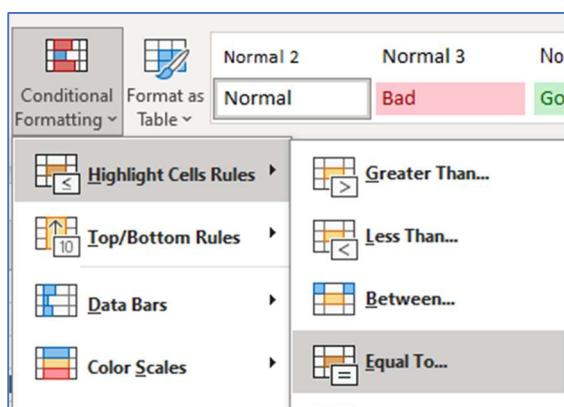
Remember to save your work and increment the draft or version number.

Conditional Sheet

Remember: Cells are referenced using their column letter followed by their row number e.g., A4, B7, Z291. Cell ranges are indicated by listing the first and last cell references separated by a colon (:) e.g., A1:B8, B7:C32, F6:G37.

The name box can be used to quickly select cells - type a cell reference or range into the name box and press enter.

Conditional formatting can be used to apply a format (colour, style, or fill) to a cell which meets the condition you specify. In this task, you will use conditional formatting to highlight cells containing values equal to the ones you provide (followed by the 'less than' option for the background).



Task

You need to **select the range of cells** you would like to be affected by the conditional formatting **before you set the rule** (A1:T24).

After selection, use conditional formatting (highlight cells) changing both font and fill.

- 1: Black
- 2: Green
- 3: Red
- 4: Dark Red
- 5: White
- <1: Light Blue

Maths Sheet

Being able to carry out calculations with formulas is a key skill that you will need when working in Excel. There are a few key differences you will need to be aware of:

- All calculations in Excel BEGIN with = (an equal sign)¹
- + and - are the same as we normally use.
- To multiply we use *
- To divide we use /

You have been supplied with a sheet containing dynamic random numbers generated by a function. Use Copy and Paste Values to convert to static numbers.

¹ The phrase "This cell is equal to" may remind you to select the cell you are using for the calculation and remind you to type =

Task 1

Write formulas, using the mathematical operators, to carry out the calculations indicated. Add your answers to an appropriate cell below the values and present accordingly.

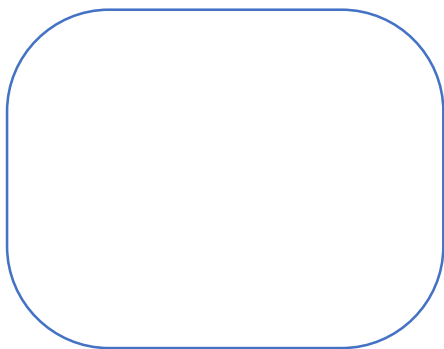
1. Add any two values
2. Subtract one value from another
3. Multiply any two values
4. Divide any two values
5. Add any three values
6. Multiply any three values

Mathematical operations can be combined. But you should do this with care.

Below is a calculation with both + and *

$$3 + 2 * 2 = ?$$

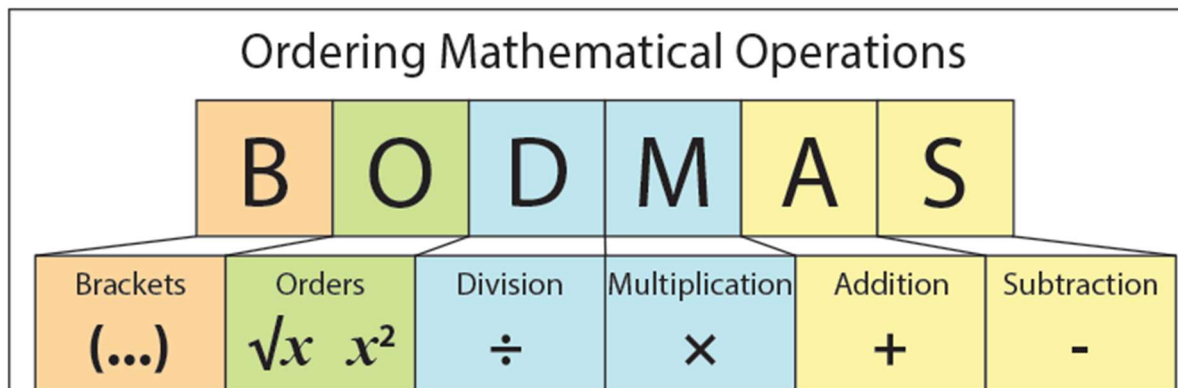
What is the answer?



Did you get 10? If so, you're not alone. Most of us work left to right without thinking.

However, like most calculators, Excel uses **BODMAS**.

BODMAS



You may also see BODMAS referred to as BEDMAS, PEDMAS, PEMDAS or PODMAS (in the US brackets are known as parenthesis).

This order of operations will usually only cause issues if you are trying to combine calculations and there are steps you can take to avoid issues.

In order to make this calculation return an answer of 10, we would need to add brackets to force Excel to do addition before multiplication.

$$(3 + 2) * 2 = 10$$

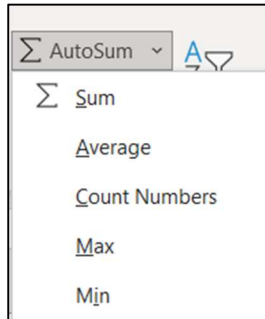
There is more information on BODMAS at

<https://www.mathsisfun.com/operation-order-bodmas.html>

The manual method to add a range of numbers like B2:B11 is tedious and prone to errors (=B1+B2+B3+...+B11). Imagine you had a few hundred values to add!!

Luckily, Excel has a built-in **function** for this and many other tasks.

The full **Function Library** can be found on the **Formulas tab**. However, there is a smaller selection in the Editing group of the Home tab which is useful as a starting point.



The **syntax** for these functions is as follows. Where I've added the word **range**, this is the range of cells you are working with. Check you understand what each function is for.

=SUM (range)

=AVERAGE (range)

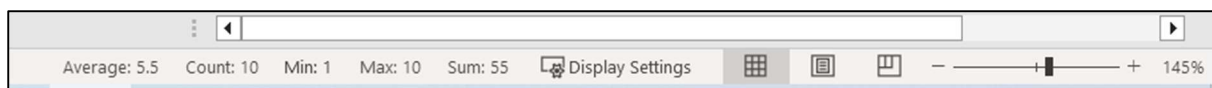
=COUNT(range)

=MAX (range)

=MIN (range)

Note: When you use these functions, there is a quick way to check your results.

- Select the cells that you are including in the range for the function
- Look for the summary in the status bar (see image below)
- Check you are getting the same results in your calculation



If you don't see Average, Count, Min, Max, and Sum on the status bar, right click the status bar to add them.

Task 2

Continuing from Task 1, carry out the calculations below. Remember you can select your data to check you are getting the correct results.

7. Calculate the sum of the values in A1:K20
8. Calculate the average of the values in A1:K20
9. Calculate the minimum value in A1:K20
10. Calculate the maximum value in A1:K20
11. Calculate how many values are in A1:K20

When a range of numbers is being used repeatedly, as in the above task, it is common to name the range. This makes it easier to use, and easier for other people to understand. To name a range, simply select the range, type the desired name in the Name Box, and press enter. **Note, names cannot contain system words or spaces.**

Task 3

Select A1:K20 and give it the name **JogTimes**. Repeat the functions using the name instead of the range.

12. Calculate the sum of the values in **JogTimes**
13. Calculate the average of the values in **JogTimes**
14. Calculate the minimum value in **JogTimes**
12. Calculate the maximum value in **JogTimes**
13. Calculate how many values are in **JogTimes**

You can quickly navigate to named ranges using the dropdown next to the Name Box. You can also manage named ranges using the **Defined Names** group on the **Formula** tab.

Errors Sheet

This sheet contains errors in formatting and calculations.

Unfortunately, Excel can sometimes be a little overzealous in error checking. It will flag errors that aren't there. This is particularly common if you're only adding a small section of a row or column. You can check formulas using CTRL + ` or by using **Show Formulas** in the **Formula Auditing** group of the **Formulas** tab.

Task

Correct the formatting, view formulas and correct (or ignore) errors as appropriate. Note totals should be specific to the individual holiday flat.

Calculations Sheet

After creating a formula, it is possible to replicate the formula to other cells by dragging the bottom-right corner of the cell right, left, up or down.

The formula will update **relative** to the cells used. This is known as **relative referencing**.

However, this updating is not always desired. To prevent any change in the cell reference in a formula, when replicating, the reference can be locked using \$.

This is known as **absolute referencing**.

The \$ sign can be placed before a row, a column, or both. If you are only locking part of a reference, it is known as **mixed referencing**.

The shortcut to apply the \$ is F4 (Fn + F4 if on a laptop). The shortcut will toggle through absolute and mixed options.

Task

Complete the subtotal in G2

Replicate for the remainder of the column

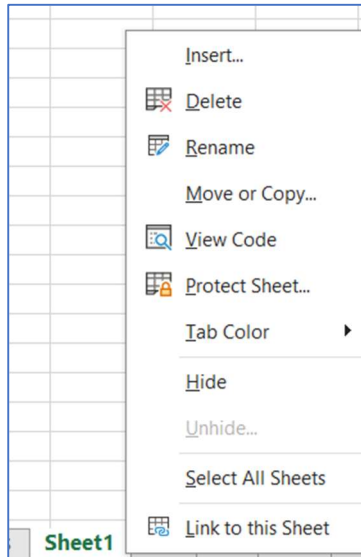
Challenge Task

Calculate the price + VAT.

Use absolute referencing before replicating.

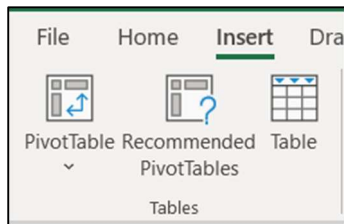
Sheet 1

By now you may have noticed that this sheet could be more appropriately named. After all, the other sheets describe the contents in some way. To rename a sheet, you can right click on the name tab.

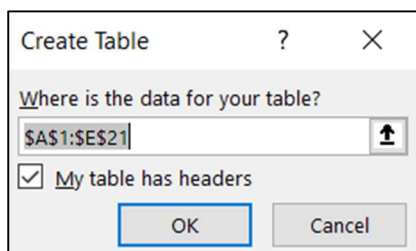


As well as Rename there are some other useful features in here. Be careful not to Delete as it is an action that cannot be undone.

Converting to a table can be done by selecting the range, clicking the **Insert** tab, and selecting the **Table** button in the **Tables** group (or by using CTRL + T)



A pop-up window should load.



You may notice that the range this time says \$A\$1:\$E\$21 instead of A1:E2. This is another example of absolute referencing.

Make sure that if you select the headers in a range, you tick the check box to indicate this.

Once converted, you will get a new **Table Design** context tab. It is in this tab that you will find the tools like **filter**, **sort**, and **Insert Slicer**.

Note: if you do not see the tabs, try clicking somewhere in the table to make them appear.

Filter and sort are both carried out using the dropdown triangle that appears next to each heading.

	A	B	C	D	E
1	Enw cyntaf	Cyfenw	Llinell gyntaf y cyfeiriad	Tref	Côd Post
2	Althea	Mould	6305 Elstow St	West Sussex	BN12 6PP

Translations:

Enw cyntaf: First Name

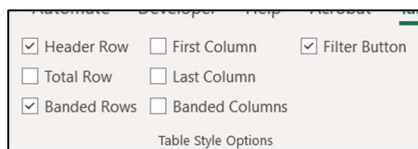
Cyfenw: Surname

Llinell gyntaf y cyfeiriad: First line of address

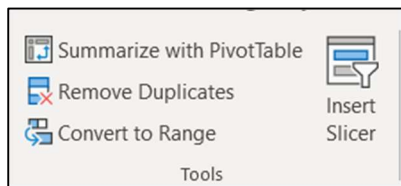
Tref: Town

Côd Post: Post Code

If you do not see this button, check that the Filter Button is ticked in the **Table Style Options group**.



The Insert Slicer button can be located in the Tools Group of the Table Design tab.



Task

Rename the sheet to Tables

Make the tab Blue.

Convert A1:E21 to a table.

Sort the data alphabetically by Cyfenw.

Add a slicer to sort by Tref. Move to an appropriate location.

Use the slicer to show only towns beginning with B.

Colour the table and slicer so that they are the same.

Charts

Click the **Insert** tab and locate the **Charts** Group.

Hover over the chart types and complete the following table:

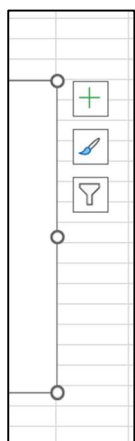
Type of Chart	Key Purpose
Column or bar chart	
Line graph	
Pie chart	
Scatter graph	
Pivot chart	

To create a chart:

1. Identify and select the categories you want to include in the chart
2. Identify and select the values for these categories. **Note:** if the values are not in adjacent cells to the categories, hold down CTRL before making the second selection.
3. Click the Insert Tab
4. Click the appropriate chart type in the Charts Group (or use Recommended Charts and let Excel suggest a chart based on the data selected)
5. Right click (in a blank area near the title) and select move chart. Move the chart to a new sheet - the sheet will be named Chart1 unless you change it.
6. Make sure your chart has a clear title and appropriate labelling.² Note, for Combo charts, it is advisable to add two axis. Look out for the option to add this.
7. Adjust the appearance of your chart as desired.

Note: A chart has two context tabs: **Chart Design** and **Chart Formatting**.

These two tabs are used to customise, label and format charts.



Each chart also has a shortcut menu (top right when selected).

This menu can be used to add chart elements, format style and colour and filter the chart data to show less detail than initially selected.

² Ask yourself “Could a stranger understand what this chart is saying about the data, even if they knew nothing about my company?”

Task

Create a minimum of one chart for each dataset provided on the Bar, Pie, Line and Combo sheets.

Move each chart you create to a new sheet, and appropriately name the sheet.

Move each sheet so that the chart is to the right of the data used to create it.

Colour both sheets in a matching colour.

Use any extra time you have to try out different data selections and create different charts using the Combo data (such as area).

Pivot (Tables and Charts)

Sometimes data is complex and needs to be viewed by many people, in many different ways. By date, by department, by product, by sales, by salesperson, etc.

In cases like this it can be better to create a Pivot Table and produce Pivot Charts.

Both of these allow you to 'pivot' the data according to your needs.

To create a pivot table, select the range, choose the **Insert** tab, and click **Pivot Table** from the **Pivot** group. A new sheet will be added to the left of the sheet containing the data. You can rename this accordingly.

Pivot table fields will be added to the right of the main window. These fields can be added to the pivot table by ticking the box. They can be removed by unticking the box, and filtered using the triangle that appears when hovering.

Below the fields you will see the ticked items. They can be added to rows, columns, or filters. Values such as totals will be added the Values pane.

You can drag the fields between these windows to change the table appearance. You can also drag fields into the main window to quickly remove them from view.

In the Pivot Table analyse ribbon, you can add a chart. The chart will contain filtering options – changes made to the table will update the chart and vice versa.

Task

Create a pivot table using the **Pivot** sheet data.

Pivot to show sales Region, Rep and Totals + VAT.

Add the Region to the **Filter** pane and filter to show just the Central Region.

Create and label a pivot chart to accompany the data.

Enlarge, format, label and resize the chart appropriately.

LOOKUPS

Lookups are a type of function that can be used to search a table (**array**) for a given lookup value and return a corresponding value.

As with all functions, it is necessary to set them up with a series of **arguments**.

Arguments will be given **in brackets and separated by commas**.

VLOOKUP is used to look up data that is stored in vertical columns

HLOOKUP is used to look up data that is stored in horizontal rows.

For both of these methods, the data you are looking up must be in Column 1 or Row 1.

XLOOKUP is a more flexible method. The lookup data can be in any row or column and there is built-in error checking. Unfortunately, XLOOKUP is only available in the more recent versions of Excel.

In all lookups, you will need to have a look value, an array/table of data to search through and a row, column to return when that value is found. An exact match can be indicated (using FALSE or 0 in the correct argument).

Task

In the workbook, the values you need are as follows:

The lookup value is in A4

The table/data array is A9:I46

The columns are as follows: Last Name is in column 2, First Name is in column 3, Dept is in column 4 and Phone Extension is in Column 6.

Complete the lookup table (B4:E4) using =VLOOKUP.

IF

An IF function can be used to check if a condition has been met, and act upon its findings. An IF function has three arguments:

Logical test: A test using mathematical operations to determine if the statement is TRUE or FALSE

Value if TRUE: A calculation or value to be output to the screen if the logical test is TRUE

Value if FALSE: A calculation or value to be output to the screen if the logical test is FALSE

Strings can be output to the screen by enclosing them in double quotes ("")

Task

Note: absolute referencing may be required in some of the following.

Calculate totals for all currency blocks (use ALT + = as a shortcut instead of SUM)

Calculate individual Percentages (annual/target) sales in column I

Calculate company Profit/Loss (company annual/company target) sales in column J

Test if a salesperson reached their target (column K). Output 1 if True, 0 if False.

Challenge: Distribute 75% of profits **equally** between eligible staff (column L).

This may require you to work out how many eligible staff there are in each year group.

LINKED DATA

In an earlier task, you saw how you could copy data and paste the values (removing the function that had been used to create them).

Another of the dropdown options in the paste area is to paste as a link.

When you paste as a link the formula bar will show the file name, the sheet name, and the cell reference (as applicable).

It is possible to paste as a link on the same sheet, in a different sheet and in another workbook.

Note: you can also create linked copies by using the equal sign (=) to start the link, selecting the data to be linked, and finalising by pressing enter.

Task

Complete the task using the paste as a link option.

Copy the values A1:E3 and paste as a link to G1:K3

Create a new sheet called Linked Data (2) and paste the same values to A1:E3 on the new sheet

Create a new workbook called Linked Data (3) and paste the same values to A1:E3 in the new workbook.

Each time you paste to a new location, pay attention to the formula bar, and see how the reference is changed to reflect the original location.

Change some of the values in the original and check that all of the linked versions update appropriately.

DASHBOARD

Now that you have seen how to link data, you can easily create a Dashboard.

See if you can create a Dashboard using the data throughout the workbook.

Your tutor has provided an example to give you some ideas.

Hints

Cut and paste may help if you are including graphs!

Design tab **Themes** are a quick way of changing the formatting.

Cell shading and borders are a nice way of setting the content apart.

You can use the **View** tab to hide **gridlines** for a more polished finish.

Notes:

Navigation

The diagram illustrates the navigation structure of the Microsoft Word ribbon, showing how different elements are categorized and highlighted.

TABS

The ribbon is divided into tabs: File, Home, Insert, Draw, Design, Layout, References, Mailings, Review, View, Developer, and Help. The 'Insert' tab is highlighted in orange.

RIBBON

The ribbon is divided into groups: Pages, Tables, Illustrations, Reuse Files, and Add-ins. The 'Insert' tab is highlighted in orange.

GROUPS

The ribbon is divided into groups: Pages, Tables, Illustrations, Reuse Files, and Add-ins. The 'Insert' tab is highlighted in orange.

BUTTONS

The ribbon is divided into groups: Pages, Tables, Illustrations, Reuse Files, and Add-ins. The 'Insert' tab is highlighted in orange.

Whenever a button has a dropdown arrow (v) below it, it means that you can click for more options.

The diagram shows a close-up of the 'Pictures' and 'Shapes' buttons, which have dropdown arrows below them, indicating that they have more options available.

Shortcuts

Shortcut	Action
CTRL + C	Copy
CTRL + X	Cut
CTRL + V	Paste
CTRL + Z	Undo
CTRL + B	Bold
CTRL + I	Italic
CTRL + U	Underline
CTRL + T	Create Table
CTRL + S	Save a workbook
CTRL + W	Close a workbook
CTRL + P	Print