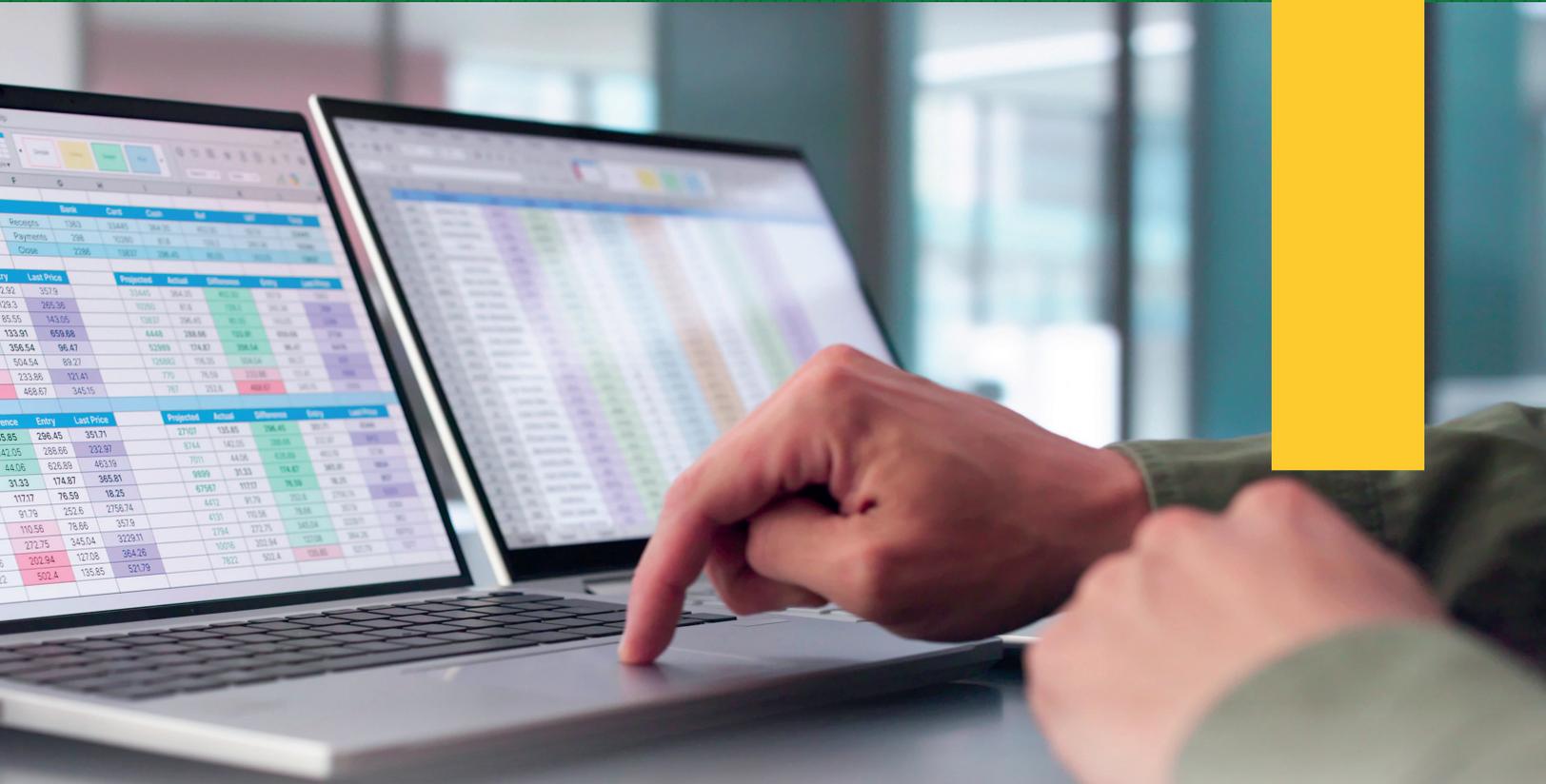


Skills  
and Pathways

# Spreadsheets

with Microsoft® Excel

## Sampler



## Skills and Pathways: Spreadsheets with Microsoft® Excel

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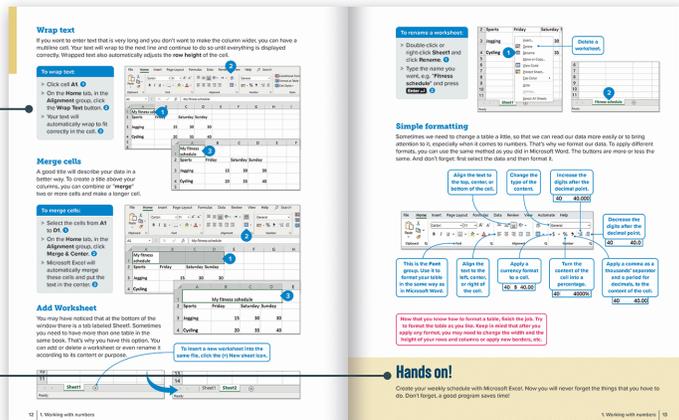
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# Key Features

- > An innovative approach to building digital competencies, developed by expert educators.
- > Curriculum aligns with the latest industry standards, preparing students for certifications and future careers.
- > Well-defined learning goals and hands-on, applicable digital skills.

Each unit offers straightforward explanations and contemporary examples, making technology concepts accessible and relevant.

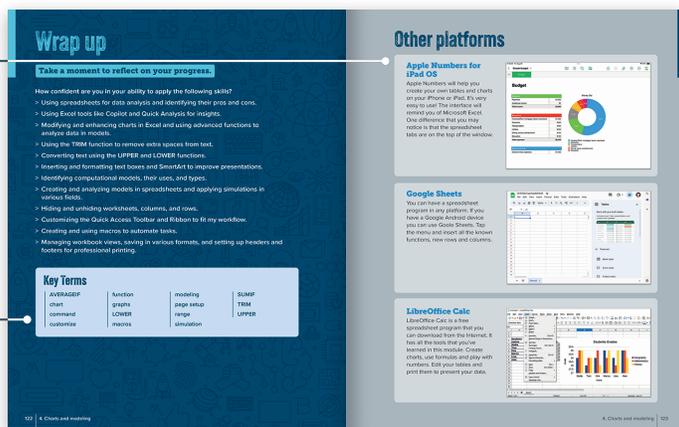
Every unit includes a variety of tasks and activities designed to help students build essential digital competencies.



Projects and exercises throughout the course reinforce students' understanding and practical application of digital skills in real-world scenarios.



Students learn about platform diversity expanding their digital toolkit and adaptability.



Each unit organizes key terms that are crucial for digital literacy, equipping students for today's technology-driven workplace.

# 1

## UNIT 1

# Working with numbers

Managing numbers and data is a skill that can help in many aspects of life, from tracking expenses to organizing information for school projects. This unit focuses on how to use spreadsheets to organize data, make calculations, and present information clearly using charts and graphs.

### Learning Objectives

In this unit, you will:

- > use spreadsheets to organize and analyze data.
- > identify the basic components of Excel, including cells, rows, columns, and worksheets, and how to enter and manipulate data.
- > recognize the importance of formatting for clear data presentation and use advanced tools like currency and date formats.
- > enhance data presentation with techniques like merging cells, aligning text, and applying borders and colors.
- > use Excel formulas for basic calculations like addition, subtraction, multiplication, and division.
- > automate calculations using functions and apply formulas across multiple cells with AutoFill.
- > use the IF function and logical functions like AND and OR for conditional calculations and data classification.
- > create different types of charts in Excel and choose the right one for your data.
- > customize charts by adjusting titles, axes, and colors.

### Tools

- > Microsoft Excel

## LESSON 1

# Rows and columns

In the past, people used to make calculations by hand on paper and mistakes were common. Then, calculators came along and minimized the mistakes. However, it was very difficult and time-consuming to deal with large amounts of information, especially for businesses. Today, thanks to **spreadsheets**, all these are problems of the past.

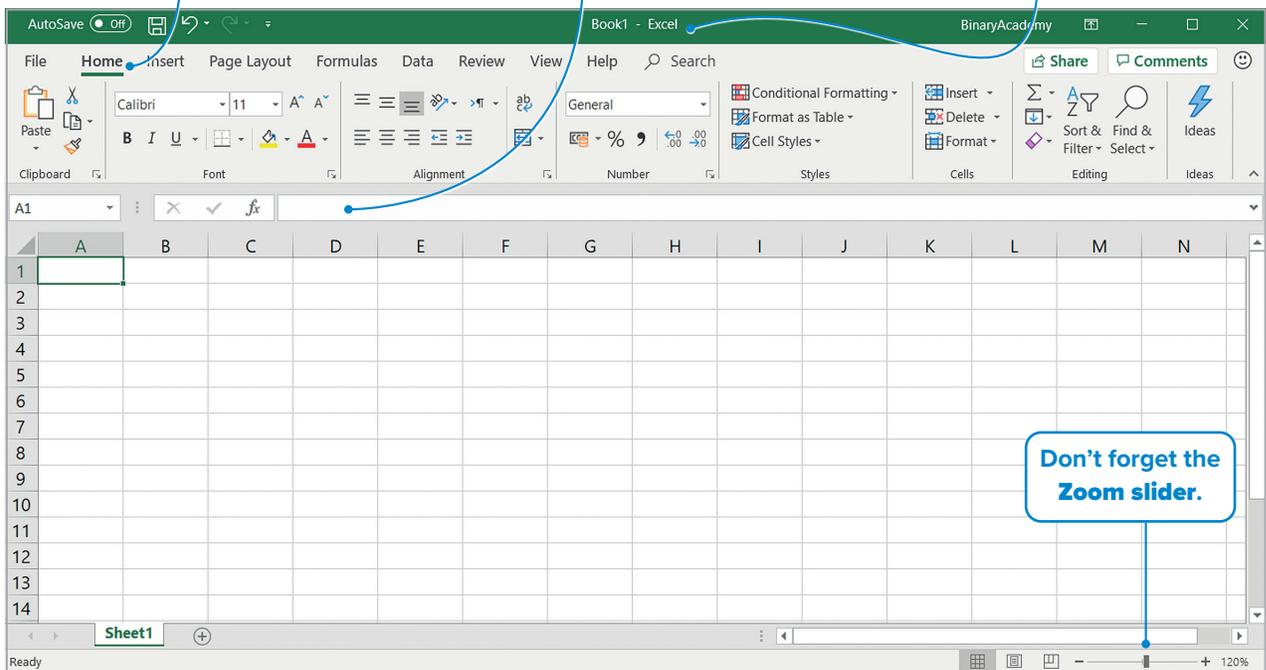
But what is a spreadsheet? It's like a large sheet of paper with lots of small boxes. People and businesses use spreadsheets mainly for organizing information and the computer does the rest, fast and accurately. Spreadsheets also help analyze information and produce charts. This is very useful.

**Microsoft Excel** is a spreadsheet program that imitates a paper spreadsheet. In Microsoft Excel, the primary document that is used to store and work with data is called a **worksheet**. Worksheets can be stored in a file, called a workbook.

All programs in the Microsoft Office suite share the same user interface: tabs, buttons, and controls are in the same place.

The **Formula bar** allows you to type formulas. You can do that in the cells, too, but here you have more space to edit your formulas.

Microsoft Excel's default file name is **Book**. This is because sometimes, in a single file, you want to have more than one table. It gives you this option through worksheets.



Don't forget the Zoom slider.



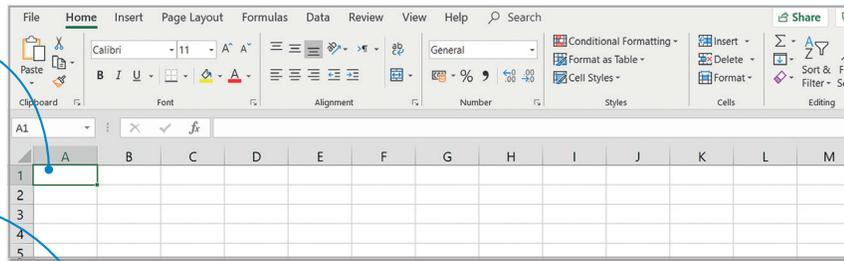
### History

The first spreadsheet program for computers was VisiCalc. It was created by Dan Bricklin and Bob Frankston in 1979 and it was the first program that turned the microcomputer from a hobby into a serious business tool.

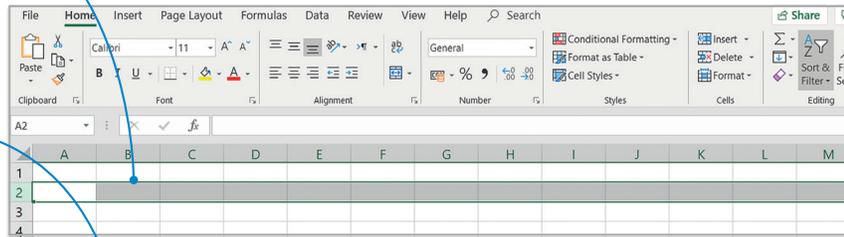
## Rows and columns

A worksheet is a grid consisting of cells arranged in rows and columns, where data is entered. A new worksheet can be opened to explore its features.

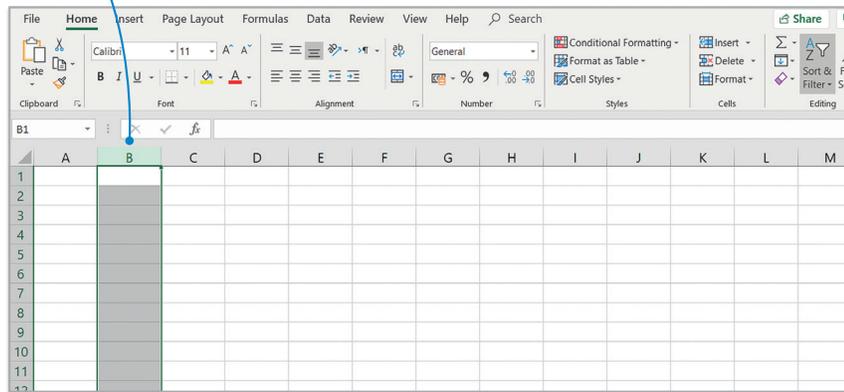
This is a cell.



This is a row. Each row has a number (1, 2, ...) on the left-hand side. These numbers are the names of the rows.

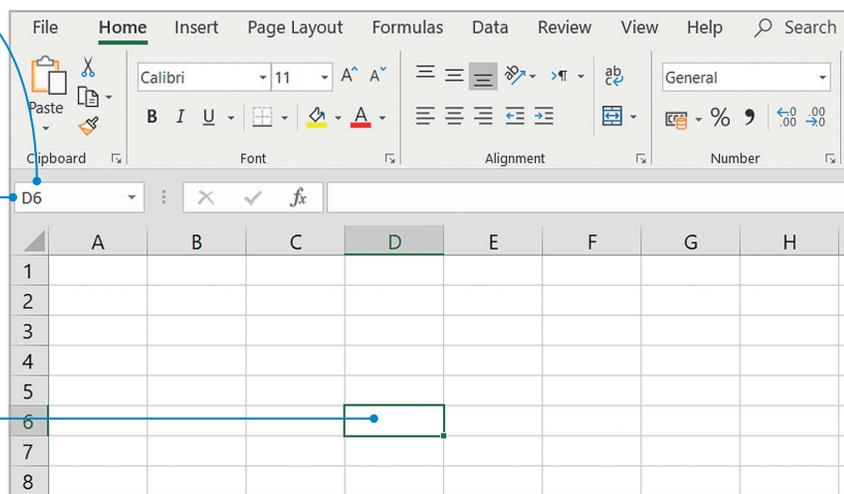


This is a column. Each column has a capital letter (A, B, ...) on the top. These letters are the names of the columns.



A selected sequence of cells is usually written like this, A1:C2, which means from cell A1 to cell C2. Individual selected cells are written, A1,B2,C3, which means cells A1 and B2 and C3.

Each cell has a unique name, consisting of the column letter and the row number (e.g., D6).



There is always the name of the active cell in the top left corner of the worksheet in the **Name Box**.

When you click a cell, it becomes active and its border becomes thicker.



### Smart Tip

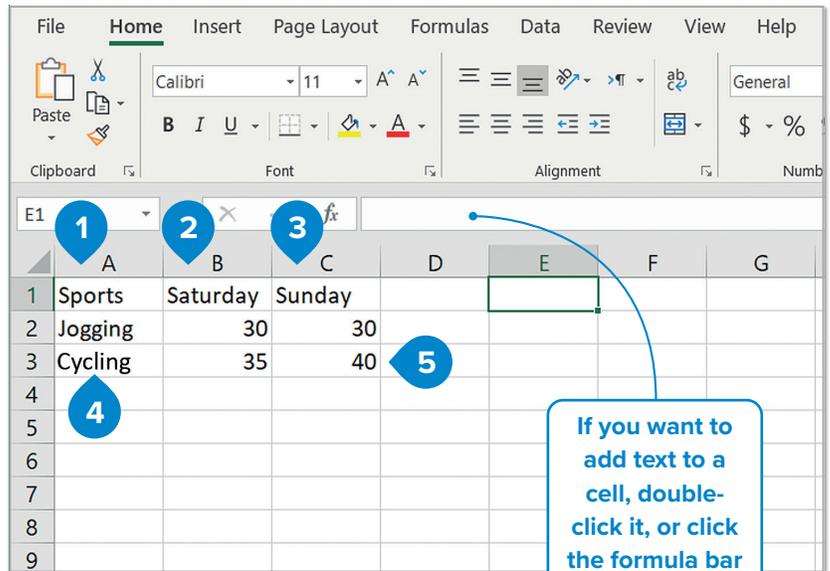
Depending on the Regional settings, to quickly locate and select specific cells, the cell references are written with a semicolon between them in the Name Box, e.g., A1;B2;C3.

## Insert text and numbers

Entering numbers and text into a worksheet involves clicking on a cell, typing, and then moving to another one. Microsoft Excel treats cells with numbers differently from cells with text. If both text and numbers are typed into a cell, Excel treats the cell as if it contains only text.

### To add text:

- > Open a new worksheet.
- > Click cell **A1** and type the word **"Sports"**. ①
- > Press **→** to go to **B1** and type the word **"Saturday"**. ②
- > Press **→** to go to **C1** and type the word **"Sunday"**. ③
- > Click cell **A2** and type the word **"Jogging"** and then click **A3** and type **"Cycling"**. ④
- > Now in cell **B2** type **"30"**, in **B3** type **"35"**, in **C2** type **"30"**, and in **C3** type **"40"**. ⑤



If you want to add text to a cell, double-click it, or click the formula bar and start typing.

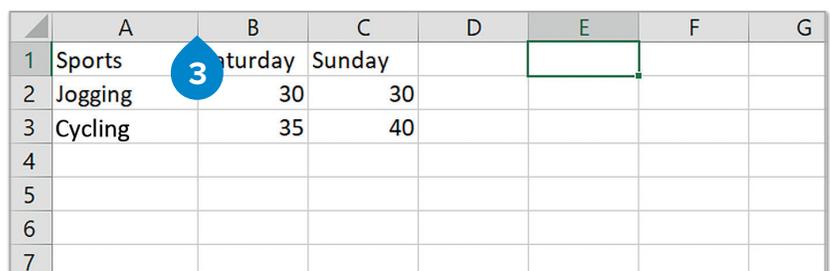
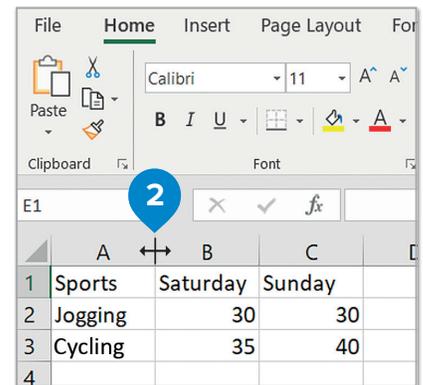
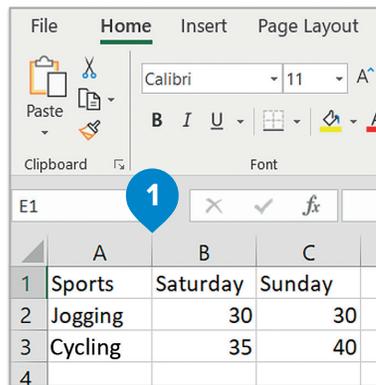
Any text you type is left-justified and all numbers are right-justified.

## Change column width

If text cannot fit into a cell, only part of the text will be visible on the screen. However, the rest of the text is not lost. To view the entire text, the column width can be adjusted (resized).

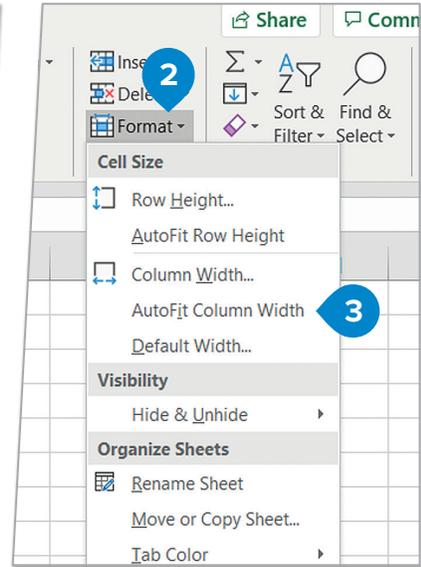
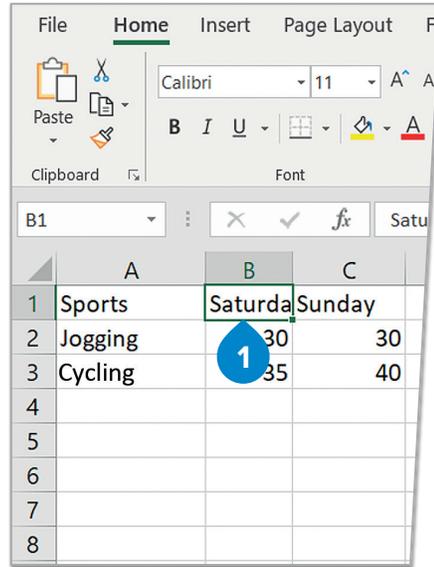
### To change the column width:

- > Point to the right side of the column you want to resize. ①
- > Your cursor will change into a double arrow pointer with a vertical line. ②
- > Click, hold and move the mouse to the left or to the right to change the width of the column. ③



### To adjust a column's width to fit its cells' contents:

- > Click a cell that you want to make wider so it fits your word/phrase. **1**
- > On the **Home** tab, in the **Cells** group, click **Format**. **2**
- > Click **AutoFit Column Width**. **3**
- > The column will automatically adjust to the width of the text in the cell. **4**



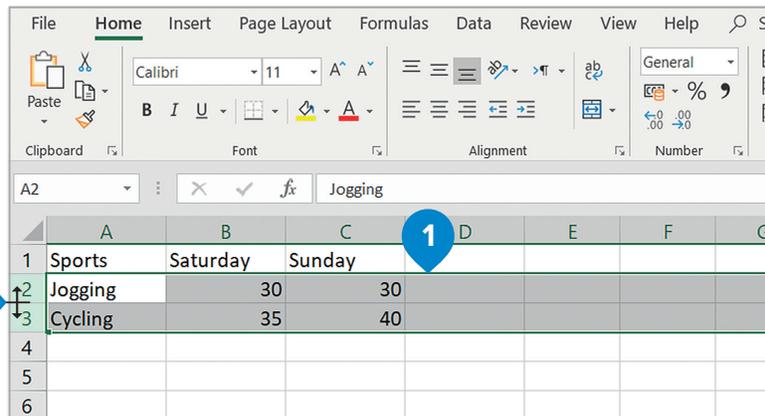
	A	B	C	D	E	F
1	Sports	Saturday	Sunday			
2	Jogging	30	30			
3	Cycling	35	40			
4						

## Change row height

To change the height of a row, the same technique used for adjusting column width can be applied. It is also possible to change the height of multiple rows simultaneously.

### To change the size of multiple rows:

- > Select the rows whose height you want to change, drag by clicking the row numbers, e.g., from row **2** to **3**. **1**
- > Point between two of the row headers that you selected. Your cursor will change into a double arrow pointer with a horizontal line. **2**
- > Click, hold and move the mouse up or down to change the height of all the selected rows simultaneously. **3**



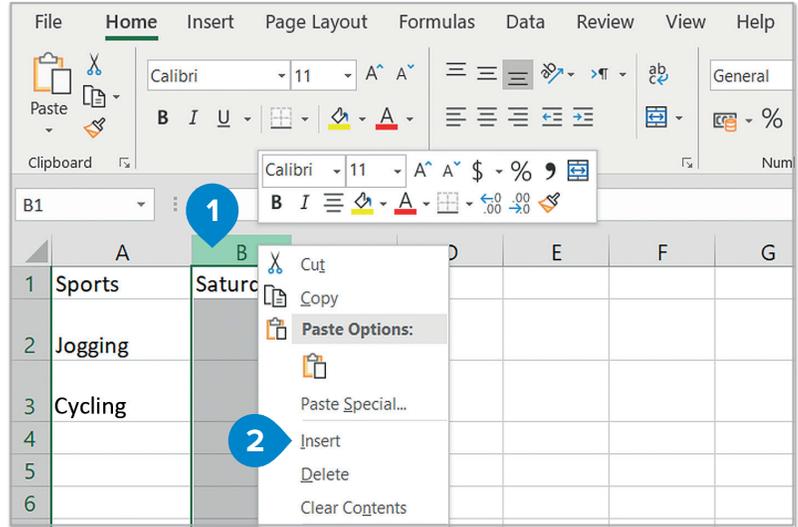
	A	B	C	D	E	F
1	Sports	Saturday	Sunday			
2	Jogging	30	30			
3	Cycling	35	40			
4						
5						
6						

## Insert columns and rows

Additional columns or rows can be added as needed. Similar to working with a table in Microsoft Word, rows and columns can be inserted anytime and anywhere within the worksheet. For example, to add the day "Friday" between "Sports" and "Saturday", simply insert a new column in the desired location.

### To insert a new column:

- > Right-click the header of a column, e.g., column **B**. **1**
- > From the drop-down menu click **Insert**. **2**
- > A new column will be inserted next to column **A**. **3**
- > Type the word "**Friday**" in cell **B1**, the number "**15**" in cell **B2**, and "**20**" in cell **B3**. **4**

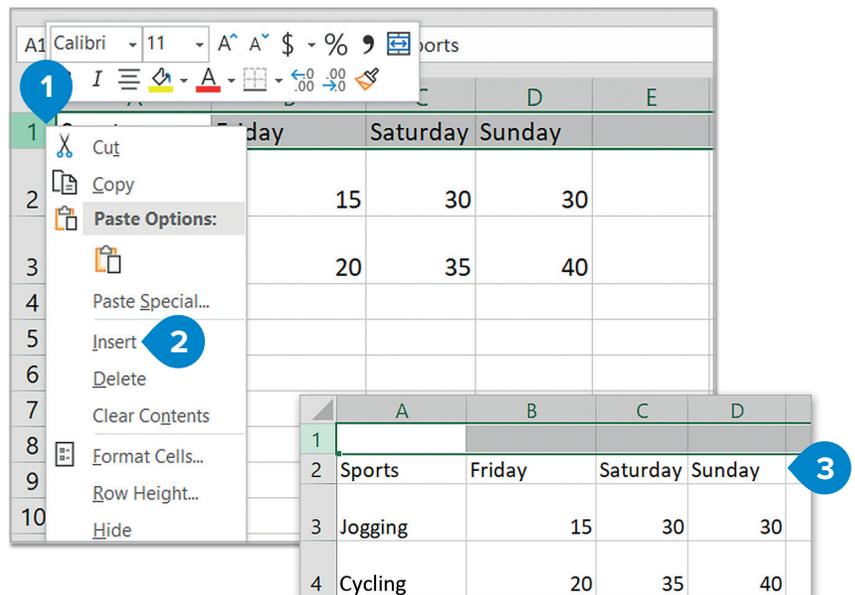


	A	B	C	D	E
1	Sports		Saturday	Sunday	
2	Jogging		30	30	
3	Cycling		35	40	

	A	B	C	D	E
1	Sports	Friday	Saturday	Sunday	
2	Jogging	15		30	
3	Cycling	20	35	40	

### To insert a new row, you will follow similar steps:

- > Right-click the header of a row, e.g., row **1**. **1**
- > From the drop-down menu click **Insert**. **2**
- > A new row will be inserted. **3**
- > Let's add a title. Click cell **A1** and type "**My fitness schedule**". **4**



If you want to automatically insert more than one row or column, simply select the number of rows or columns you want to add. E.g., if you want to insert two columns next to column C, select columns D and E, right-click and select Insert. Two new columns will be added next to column C.

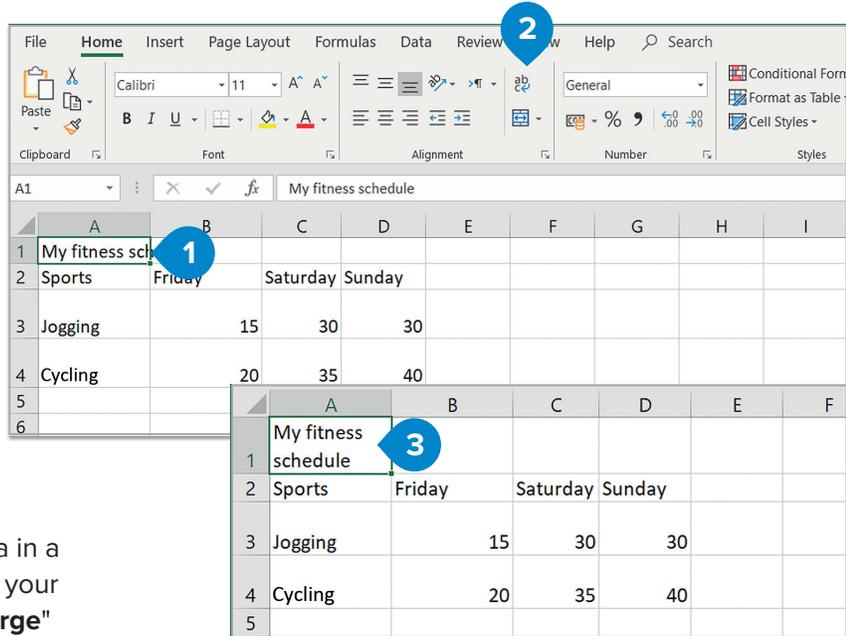
	A	B	C	D
1	My fitness schedule			
2	Sports	Friday	Saturday	Sunday
3	Jogging		15	30
4	Cycling		20	35

## Wrap text

For long text that doesn't require a wider column, a multiline cell can be used. The text will wrap to the next line and continue wrapping until all of it is displayed correctly. Additionally, wrapped text automatically adjusts the **row height** to accommodate the content.

### To wrap text:

- > Click cell **A1**. **1**
- > On the **Home** tab, in the **Alignment** group, click the **Wrap Text** button. **2**
- > Your text will automatically wrap to fit correctly in the cell. **3**

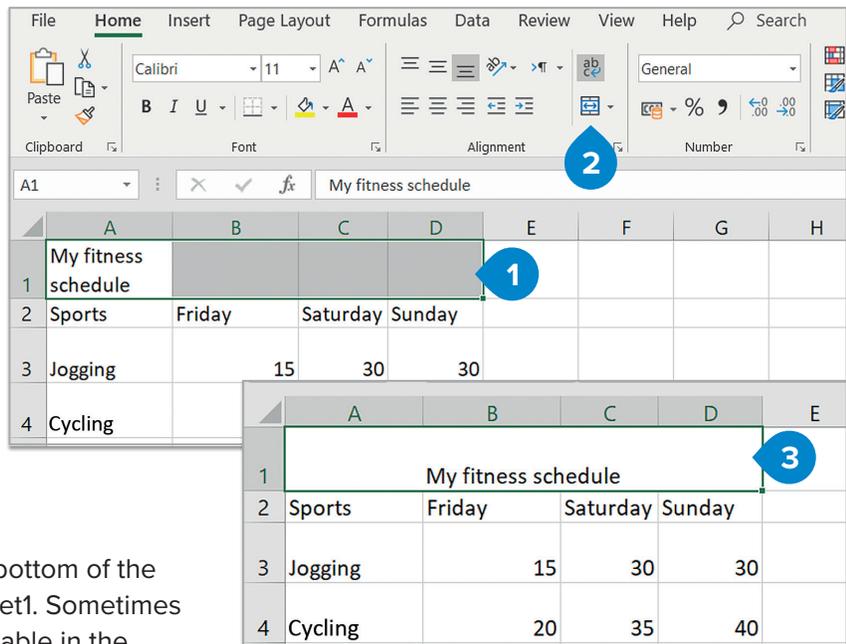


## Merge cells

A good title will describe your data in a better way. To create a title above your columns, you can combine or "merge" two or more cells and make a longer cell.

### To merge cells:

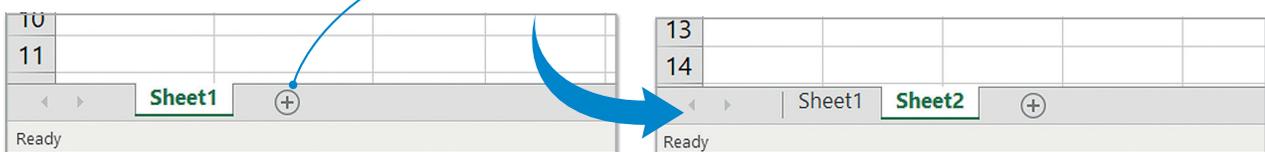
- > Select the cells from **A1** to **D1**. **1**
- > On the **Home** tab, in the **Alignment** group, click **Merge & Center**. **2**
- > Microsoft Excel will automatically merge these cells and put the text in the center. **3**



## Add Worksheet

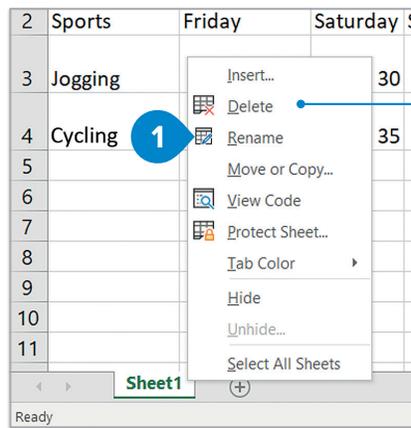
You may have noticed that at the bottom of the window there is a tab labeled Sheet1. Sometimes you need to have more than one table in the same book. That's why you have this option. You can add or delete a worksheet or even rename it according to its content or purpose.

To insert a new worksheet into the same file, click the (+) New sheet icon.

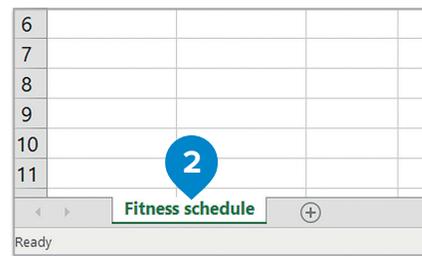


### To rename a worksheet:

- > Double-click or right-click **Sheet1** and click **Rename**. 1
- > Type the name you want, e.g., "**Fitness schedule**" and press **Enter**. 2



Delete a worksheet.



## Simple formatting

Occasionally, tables need to be adjusted for better readability or to highlight specific data, particularly with numbers. This is where formatting comes in. To apply different formats, the same method used in Microsoft Word can be applied. The buttons are similar, and it's important to first select the data before applying the format.

A screenshot of the Microsoft Excel ribbon, specifically the 'Home' tab. The ribbon is divided into groups: Clipboard, Font, Paragraph, Styles, Alignment, Numbers, and Cells. Callouts with blue boxes and arrows point to various options:

- Align the text to the top, center, or bottom of the cell.** (Points to the Paragraph group)
- Change the type of the content.** (Points to the Font group)
- Increase the digits after the decimal point.** (Points to the Number group)
- Decrease the digits after the decimal point.** (Points to the Number group)
- This is the Font group. Use it to format your table in the same way as in Microsoft Word.** (Points to the Font group)
- Align the text to the left, center, or right of the cell.** (Points to the Paragraph group)
- Apply a currency format to a cell.** (Points to the Number group)
- Turn the content of the cell into a percentage.** (Points to the Number group)
- Apply a comma as a thousands' separator and a period for decimals, to the content of the cell.** (Points to the Number group)

Examples of formatted numbers are shown in small boxes:

- 40, 40.000
- 40, 40.0
- 40, \$ 40.00
- 40, 4000%
- 40, 40.00

Now that you know how to format a table, finish the job. Try to format the table as you like. Keep in mind that after you apply any format, you may need to change the width and the height of your rows and columns or apply new borders, etc.

## Hands on!

Create your weekly schedule with Microsoft Excel. Now you will never forget the tasks that you have to do. Don't forget, a good program saves time!

For Review Purposes Only

## LESSON 2

# Advanced formatting

So far, a small table has been created and formatted for clarity. Next, the focus will shift to understanding the meaning of numbers and further formatting options. Some of the topics to explore include the difference between numbers and currency, and how to enter dates into a cell.

The task will involve creating a grocery list, including the items to purchase, their quantities, and the cost of each product. After entering the data, the list will be formatted using advanced options.

## Currency

Let's start with the price. A typical use of Microsoft Excel is to gather data that has to do with money. In such cases, you need to change the numbers into a currency format.

	A	B	C	D	E
1	9/25/2023				
2	Grocery List				
3	Item	Quantity	Price	Total	
4	Milk	2	1		
5	Bread	2	0.5		
6	Orange juice	1	1.2		
7	Apples	2	2		
8	Potatoes	3	1.5		
9	Tomatoes	1	0.8		

### To apply a currency format:

- > Select the cells you want, e.g., **C4 to C9**. **1**
- > On the **Home** tab, in the **Number** group, from the **Number Format** list, **2** click **Currency**. **3**
- > The format of your cells has changed. **4**

	A	B	C	D
1	9/25/2023			
2	Grocery List			
3	Item	Quantity	Price	Total
4	Milk	2	\$1.00	
5	Bread	2	\$0.50	
6	Orange juice	1	\$1.20	
7	Apples	2	\$2.00	
8	Potatoes	3	\$1.50	
9	Tomatoes	1	\$0.80	
10				
11	*Apples, potatoes and tomatoes are in kilos.			
12				
13				
14				
15				
16				
17				

123 No specific format

12 Number 1.00

**3** Currency \$1.00

Accounting \$1.00

Date 01/01/1900

Date 01/01/00

Time 00:00:00

% Percentage 100.00%

1/2 Fraction 1

10<sup>2</sup> Scientific 1.00E+00

ab Text 1

More Number Formats...

You can choose between Number, Currency, Accounting, and Percentage. Accounting aligns the values at the decimal point.

## Date

Microsoft Excel offers a range of date formats to choose from, allowing for greater flexibility in how dates are displayed.

### To apply Date or Time:

- > Select the cell that contains the date you want to format, e.g., **A1**. **1**
- > On the **Home** tab, in the **Number** group, click the **Expand** button. **2**
- > The **Format Cells** window will open. Click **Date**. **3**
- > In the **Type** list, **4** click the type you like and then click **OK**. **5**

The date must be in the format that your computer is set to.

Not all countries use the same date format. Some put the day before the month.

	A	B
1	9/25/2023	
2	Grocery List	
3	Item	Quantity
4	Milk	2

25-Sep-23

25-Sep-23

Grocery List

Item Quantity

Milk 2

25-Sep-23

Grocery List

Item Quantity Price Total

Milk 2 € 3

Bread 2 € 1

Orange juice 1 € 2

Apples 2 € 2

Potatoes 3

Tomatoes 1

\*Apples, potatoes and tomatoes

## Merge cells, wrap text, and set alignment

The previous task was about how you can format data. All of these options are included in a single window.

### To merge cells, wrap the text, and align it:

- > Select the cells you want to merge, e.g., **A2 to D2**. **1**
- > On the **Home** tab, in the **Number** group, click the **Expand** button. **2**
- > In the **Format Cells** window, click the **Alignment** tab. **3**
- > Select the **Wrap text** **4** and **Merge cells** check boxes. **5**
- > In the **Horizontal** list, click **Center** and in the **Vertical** list, click **Center** again. **6**
- > Click **OK**. **7**

Keep in mind that through the Expand button you have more options like custom text orientation.

You can also change the indentation or the orientation of the text.

	A	B	C	D
1	25-Sep-23			
2	Grocery List			
3	Item	Quantity	Price	Total
4	Milk	2	€ 3	
5	Bread	2	€ 1	
6	Orange juice	1	€ 2	
7	Apples	2	€ 2	
8	Potatoes	3		
9	Tomatoes	1		
10				
11	*Apples, potatoes and tomatoes			
12				
13				
14				

25-Sep-23

Grocery List

Item Quantity Price Total

Milk 2 € 3

Bread 2 € 1

Orange juice 1 € 2

Apples 2 € 2

Potatoes 3

Tomatoes 1

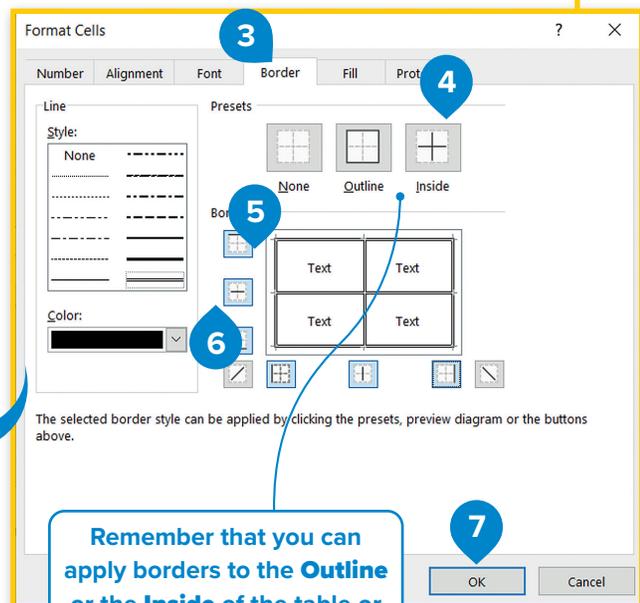
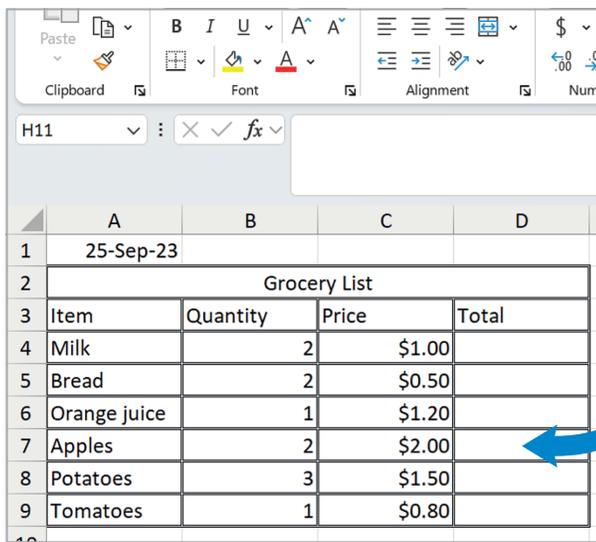
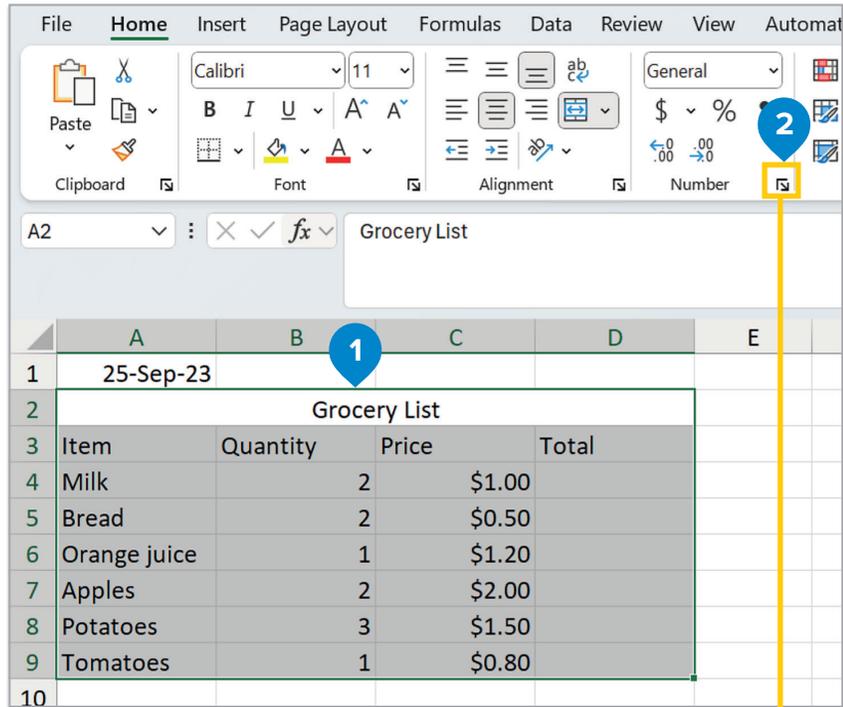
\*Apples, potatoes and tomatoes

## Borders and shading

Table formatting involves borders and colors. You can use borders and shading to divide your data into groups or to make differences and similarities more noticeable.

### To apply a border:

- > Select the table, e.g., **A2** to **D9**. **1**
- > On the **Home** tab, in the **Number** group, click the **Expand** button. **2**
- > In the **Format Cells** window, click the **Border** tab. **3**
- > Select a border style, e.g., click **Outline** and then click **Inside**. **4**
- > In the **Style** **5** and **Color** **6** lists, click the line style and the color you like and then click **OK**. **7**



Remember that you can apply borders to the **Outline** or the **Inside** of the table or you can choose different styles for each side.



### History

VisiCalc was the first spreadsheet program. Later, Lotus 1-2-3 made it easier to use spreadsheets and it added integrated charting and database capabilities. Lotus 1-2-3 established spreadsheet software as a data presentation package as well as a complex calculation tool.

## To apply colors:

- > Select the table or the cell you want to format, e.g., the title in cell **A2**. **1**
- > On the **Home** tab, in the **Number** group, click the **Expand** button. **2**
- > In the **Format Cells** window, click the **Fill** tab. **3**
- > Click the color you want **4** and click **OK**. **5**

Excel interface showing the 'Home' tab and the 'Format Cells' dialog box. The 'Format Cells' dialog box is open, and the 'Fill' tab is selected. A color swatch is highlighted with a blue circle '4'. A blue circle '3' is also present near the dialog box.

Excel interface showing the 'Home' tab and the 'Format Cells' dialog box. The 'Format Cells' dialog box is open, and the 'Fill' tab is selected. A color swatch is highlighted with a blue circle '4'. A blue circle '3' is also present near the dialog box.

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## Insert image

Similar to Microsoft Word, images can be inserted to enhance the appeal of a table. An image can be inserted from the Illustrations section, placed anywhere within the table, and formatted as needed. However, avoid using the Format tab for this process.

### To insert an image:

- > On the **Insert** tab, in the **Illustrations** group, click **Pictures** 1 then point to **Place over cells** and click **Online Pictures**. 2
- > In the **Online Pictures** window, type a keyword or phrase in the search box and press **Enter**. 3
- > Select one of the images 4 and click **Insert**. 5
- > The image you chose will be automatically inserted in your worksheet. 6

Item	Quantity	Price
Milk	2	
Bread	2	
Orange juice	1	
Apples	2	
Potatoes	3	
Tomatoes	1	

### To format an image:

- > Right-click the image and then click **Format Picture**. 1
- > You will find the **Format Picture** pane, where you can find many options to format the image, 2 e.g., you can use **Size** to change the size of the image. 3
- > Experiment to get the desired results.

## Hands on!

Make your own grocery list. What do you usually buy from the supermarket?

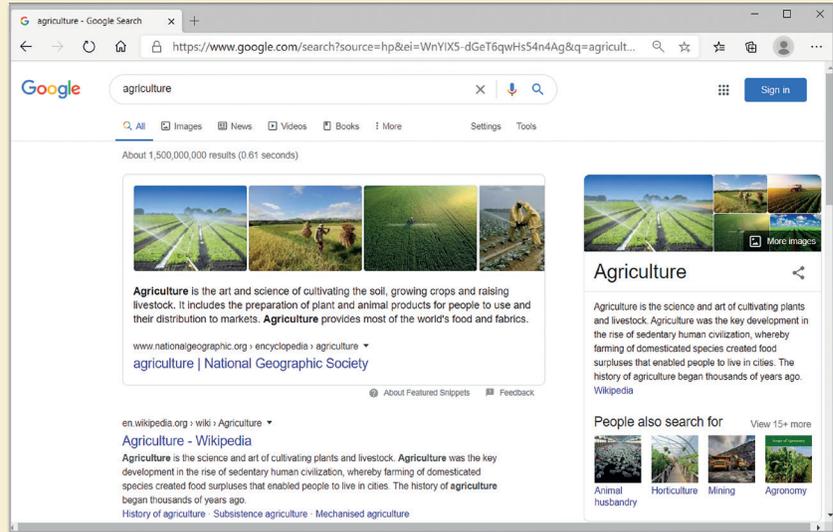
For Review Purposes Only

# Project

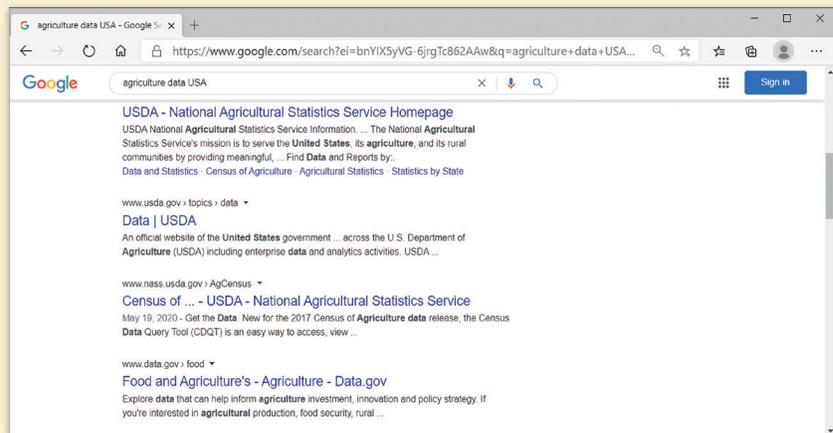
## Analyzing your country's agriculture

Gather information about the agricultural production of your country.

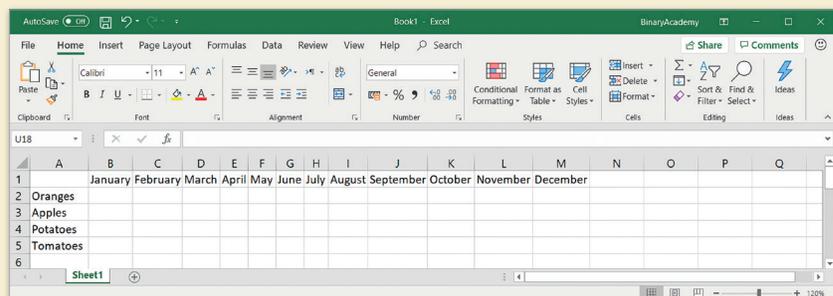
- > Go on the Internet and gather information about these two subjects: which types of agriculture products your country produces and which are the most popular ones. Use websites with relevant information.



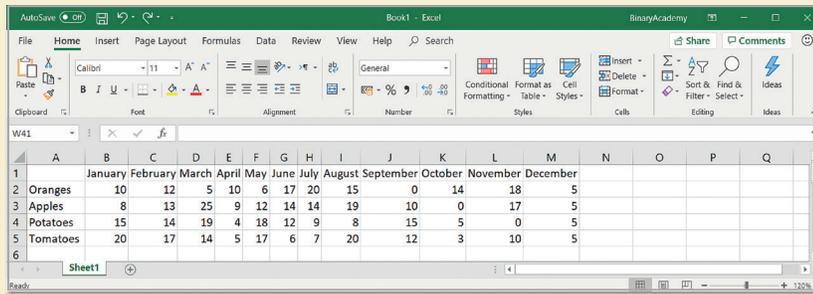
- > It's time for statistics. After you decide which products you are going to analyze, start to gather statistics on them. For example, find out how much of that product your country produces, in which months, etc.



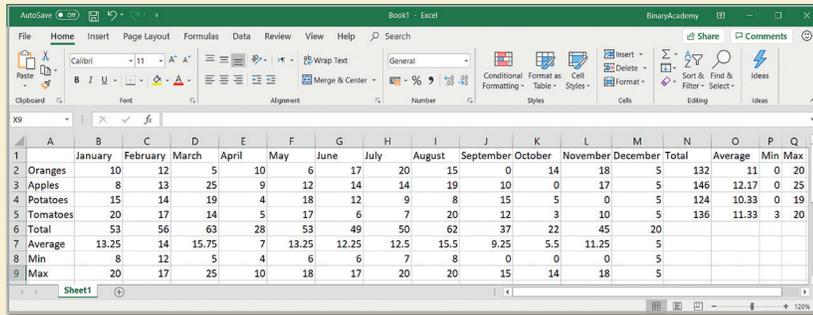
- > Fill in the table with all the useful information that you have gathered.



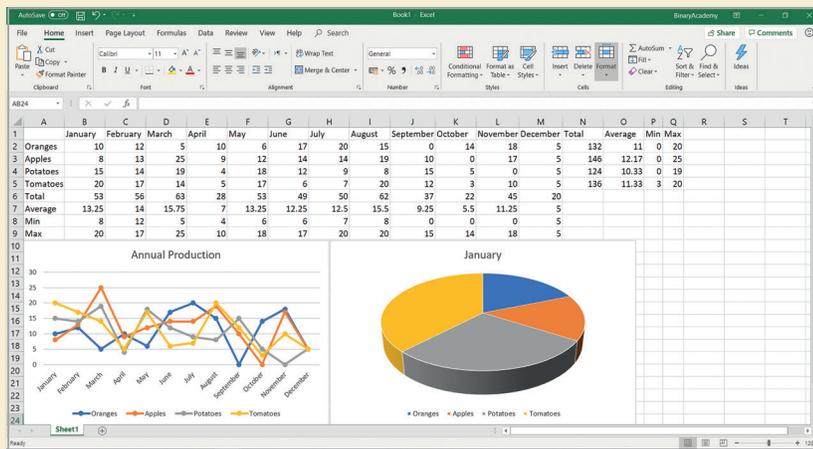
> After you gather all the necessary information, put it on a worksheet. Open Microsoft Excel and try to organize your data. Arrange it in a way that you think makes your data easier to read.



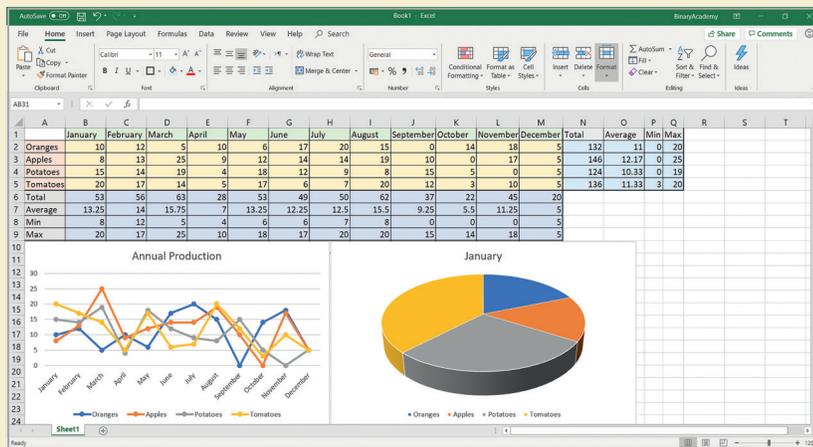
> After you're done with your data, focus on the statistics. What are the total and average amounts of the products per month or per year, etc.



> Don't forget that there are no statistics without charts. Create different types of charts to compare all the data and provide a visual representation of what you have gathered so far.



> Finally, don't forget to format your table.



# Wrap up

**Take a moment to reflect on your progress.**

How confident are you in your ability to apply the following skills?

- > Describing the basic components of a spreadsheet.
- > Understanding how to enter and format data in Excel.
- > Creating and formatting tables for clear data organization.
- > Using different formatting options, number formats, and text alignments.
- > Designing appealing spreadsheets using advanced formatting tools.
- > Using basic arithmetic operators and formulas for calculations.
- > Applying functions and AutoFill for efficient data management.
- > Using the IF function and logical functions for conditional operations and data analysis.
- > Identifying, creating, and customizing various charts for clear data presentation and selecting appropriate charts for different datasets.

## Key Terms

autofill

autofit

AVERAGE

axis

calculation

cell

chart

column

column width

criterion

currency

decimal

division

false

formula

formula bar

function

grid

IF

legend

MAX

merge

MIN

percentage

row

row height

spreadsheet

style

subtraction

SUM

true

worksheet

# Spreadsheets

with Microsoft® Excel

## From raw data to useful insights

Have you ever wondered how some people make sense of large sets of numbers, turning them into clear, useful data and insights? Imagine having the power to organize, analyze, and visualize data like a pro. What if you could use spreadsheets to solve real problems and tell stories with numbers?

**Skills and Pathways: Spreadsheets with Microsoft® Excel** guides you from managing rows and columns to using complex functions for data analysis. You'll learn how to create charts, work with tables, and use data modeling to predict outcomes—all with practical examples that help make data analysis easy.

By the end, you'll not only feel confident in your spreadsheet skills, but you'll also be prepared to earn a credential that shows you know how to turn data into meaningful insights—ready to take on any challenge with clarity and precision.



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