

الفيزياء الطبية

المرحلة الاولى

Excel

lecture "9"

تدريسي المادة

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Introduction:

One of the most powerful features in Excel is the ability to calculate numerical information using formulas. Just like a calculator, Excel can add, subtract, multiply, and divide.

Mathematical operators:

Excel uses standard operators for formulas: a plus sign for addition (+), minus sign for subtraction (-), asterisk for multiplication (*), forward slash for division (/), and caret (^) for exponents.

Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponents	^

Figure 1 : operators

All formulas in Excel must begin with an equals sign (=). This is because the cell contains, or is equal to, the formula and the value it calculates.

Understanding cell references:

While you can create simple formulas in Excel using numbers (for example, =2+2 or =5*5), most of the time you will use cell addresses to

create a formula. This is known as making a cell reference. Using cell references will ensure that your formulas are always accurate because you can change the value of referenced cells without having to rewrite the formula.

By combining a mathematical operator with cell references, you can create a variety of simple formulas in Excel. Formulas can also include a combination of cell references and numbers, as in the examples below:

<code>=A1+A2</code>	Adds cells A1 and A2
<code>=C4-3</code>	Subtracts 3 from cell C4
<code>=E7/J4</code>	Divides cell E7 by J4
<code>=N10*1.05</code>	Multiplies cell N10 by 1.05
<code>=R5^2</code>	Finds the square of cell R5

Figure 2 : formulas examples

To create a formula:

1. Select the cell that will contain the formula.
2. Type the equals sign (=). Notice how it appears in both the cell and the formula bar.
3. Type the cell address of the cell you want to reference first. A blue border will appear around the referenced cell.

SUM			
✕ ✓ f _x =D10			
	B	C	D
2			
3	QUANTITY	PRICE PER UNIT	LINE TOTAL
4	15	\$8.75	
5	18	\$2.59	
6	9	\$14.25	
7	12	\$2.99	
8			
9			
10		JUNE BUDGET	\$1,200
11		JULY BUDGET	\$1,500
12		TOTAL	=D10

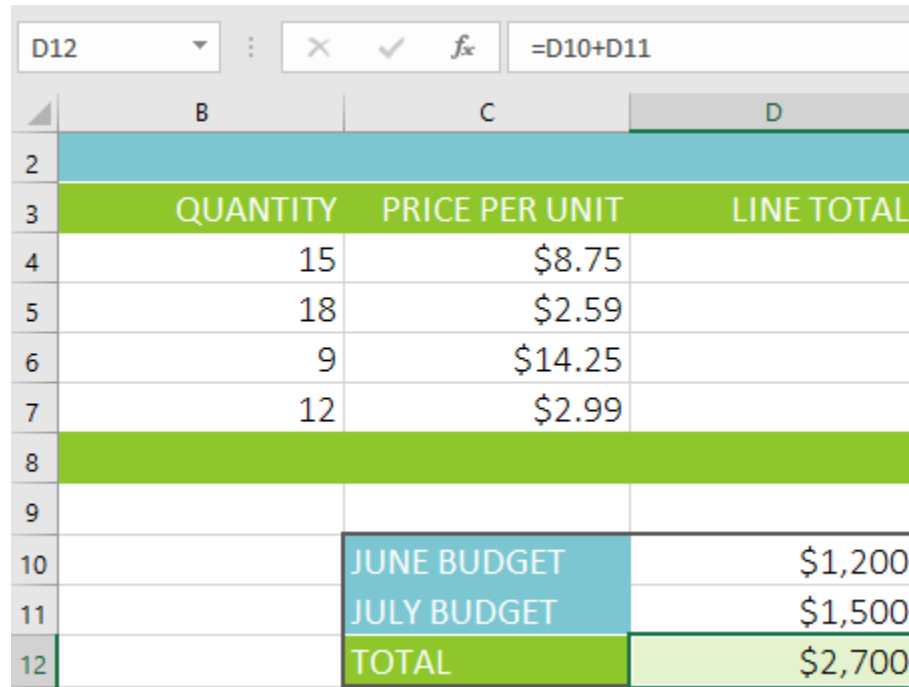
Figure 3 : formulas cell reference

4. Type the mathematical operator you want to use.
5. Type the cell address of the cell you want to reference second cell. A red border will appear around the referenced cell.

SUM			
✕ ✓ f _x =D10+D11			
	B	C	D
2			
3	QUANTITY	PRICE PER UNIT	LINE TOTAL
4	15	\$8.75	
5	18	\$2.59	
6	9	\$14.25	
7	12	\$2.99	
8			
9			
10		JUNE BUDGET	\$1,200
11		JULY BUDGET	\$1,500
12		TOTAL	=D10+D11

Figure 4 : formulas create operator

6. Press Enter on your keyboard. The formula will be calculated, and the value will be displayed in the cell. If you select the cell again, notice that the cell displays the result, while the formula bar displays the formula.



	B	C	D
2			
3	QUANTITY	PRICE PER UNIT	LINE TOTAL
4	15	\$8.75	
5	18	\$2.59	
6	9	\$14.25	
7	12	\$2.99	
8			
9			
10		JUNE BUDGET	\$1,200
11		JULY BUDGET	\$1,500
12		TOTAL	\$2,700

Figure 5 : formulas create result

To create a formula using the point-and-click method:

Instead of typing cell addresses manually, you can point and click the cells you want to include in your formula. This method can save a lot of time and effort when creating formulas.

1. Select the cell that will contain the formula.
2. Type the equals sign (=).
3. Select the cell you want to reference first. The cell address will appear in the formula.

4. Type the mathematical operator you want to use.
5. Select the cell you want to reference second The cell address will appear in the formula.
6. Press Enter on your keyboard. The formula will be calculated, and the value will be displayed in the cell.

Copying formulas with the fill handle:

Formulas can also be copied to adjacent cells with the fill handle, which can save a lot of time and effort if you need to perform the same calculation multiple times in a worksheet. The fill handle is the small square at the bottom-right corner of the selected cell(s).

1. Select the cell containing the formula you want to copy. Click and drag the fill handle over the cells you want to fill.
2. After you release the mouse, the formula will be copied to the selected cells.

To edit a formula:

1. Select the cell containing the formula you want to edit.
2. Click the formula bar to edit the formula. You can also double-click the cell to view and edit the formula directly within the cell.

	B	C	D
2			
3	QUANTITY	PRICE PER UNIT	LINE TOTAL
4	15	\$8.75	\$131.25
5	18	\$2.59	\$46.62
6	9	\$14.25	\$128.25
7	12	\$2.99	\$35.88
8			
9			
10		JUNE BUDGET	\$1,200
11		JULY BUDGET	\$1,500
12		TOTAL	\$1,500

Figure 6 : formulas edit click

3. A border will appear around any referenced cells.
4. When you're finished, press Enter on your keyboard or select the Enter command in the formula bar.

	B	C	D
2			
3	QUANTITY	PRICE PER UNIT	LINE TOTAL
4	15	\$8.75	\$131.25
5	18	\$2.59	\$46.62
6	9	\$14.25	\$128.25
7	12	\$2.99	\$35.88
8			
9			
10		JUNE BUDGET	\$1,200
11		JULY BUDGET	\$1,500
12		TOTAL	=D10+D11

Figure 7 : formulas edit enter

5. The formula will be updated, and the new value will be displayed in the cell.

Functions:

In order to work correctly, a function must be written a specific way, which is called the syntax. The basic syntax for a function is the equals sign (=), the function name (SUM, for example), and one or more arguments. Arguments contain the information you want to calculate.

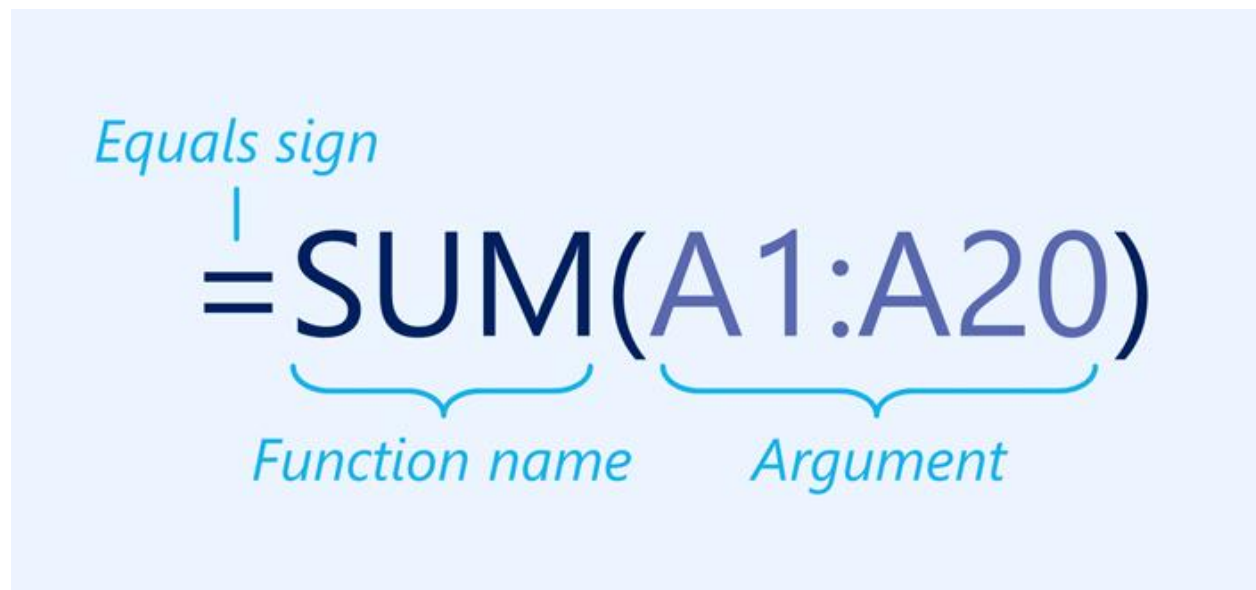


Figure 8 : functions syntax

Working with arguments:

Arguments can refer to both individual cells and cell ranges and must be enclosed within parentheses. You can include one argument or multiple arguments, depending on the syntax required for the function.

Creating a function:

There are a variety of functions available in Excel. Here are some of the most common functions you'll use:

1. **SUM:** This function adds all of the values of the cells in the argument.
2. **AVERAGE:** This function determines the average of the values included in the argument. It calculates the sum of the cells and then divides that value by the number of cells in the argument.
3. **COUNT:** This function counts the number of cells with numerical data in the argument. This function is useful for quickly counting items in a cell range.
4. **MAX:** This function determines the highest cell value included in the argument.
5. **MIN:** This function determines the lowest cell value included in the argument.

To create a function using the AutoSum command:

The AutoSum command allows you to automatically insert the most common functions into your formula, including SUM, AVERAGE, COUNT, MAX, and MIN.

1. Select the cell that will contain the function.
2. In the Editing group on the Home tab, click the arrow next to the AutoSum command. Next, choose the desired function from the drop-down menu.

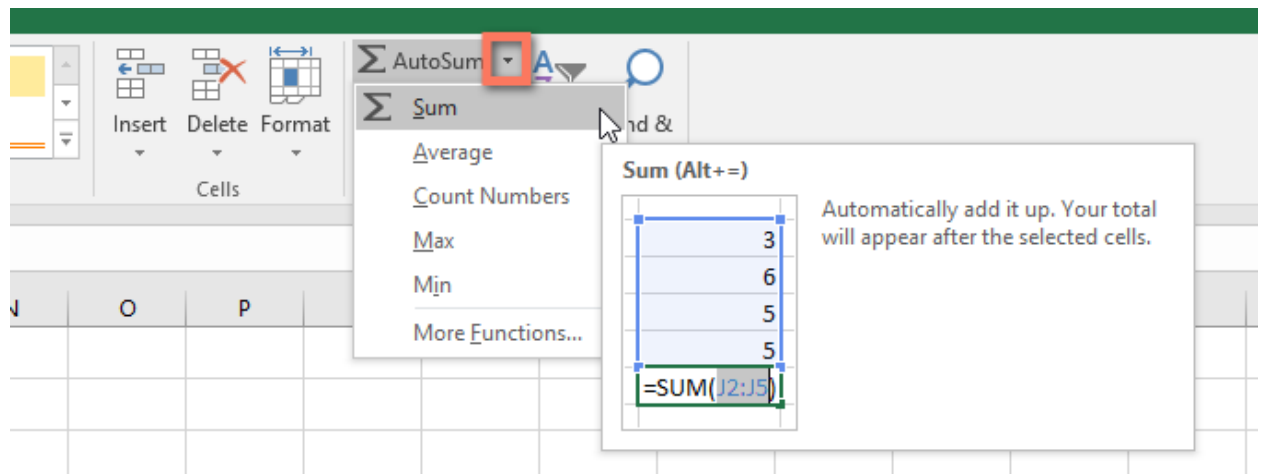


Figure 9 : functions autosum command

3. Excel will place the function in the cell and automatically select a cell range for the argument.
4. Press Enter on your keyboard. The function will be calculated, and the result will appear in the cell.

To enter a function manually:

If you already know the function name, you can easily type it yourself.

1. Select the cell that will contain the function.
2. Type the equals sign (=), then enter the desired function name.
You can also select the desired function from the list of suggested functions that appears below the cell as you type.

Frontier Kids Cookie Sales		
Troop Name	Troop ID	Units Sold
North Bend	#3506	1004
Silver Lake	#2745	938
Mountain Top	#1038	745
Rocky Trail	#3759	729
Forest Path	#4157	862
Green Valley	#1932	890
River View	#4233	775
Average Units		=AVERAGE

Figure 10 : functions basic

3. Enter the cell range for the argument inside parentheses.

Frontier Kids Cookie Sales		
Troop Name	Troop ID	Units Sold
North Bend	#3506	1004
Silver Lake	#2745	938
Mountain Top	#1038	745
Rocky Trail	#3759	729
Forest Path	#4157	862
Green Valley	#1932	890
River View	#4233	775
Average Units		=AVERAGE(C3:C9)

Figure 11 : functions basic argument

4. Press Enter on your keyboard. The function will be calculated, and the result will appear in the cell.