

## Introduction

Microsoft Excel is one of the most used software applications of all time. Hundreds of millions of people around the world use Microsoft Excel. You can use Excel to enter all sorts of data and perform financial, mathematical or statistical calculations.

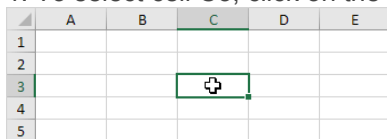
## Range

A range in Excel is a collection of two or more cells. This chapter gives an overview of some very important range operations.

Cell, Row, Column

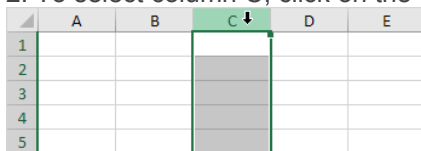
Let's start by selecting a cell, row and column.

1. To select cell C3, click on the box at the intersection of column C and row 3.



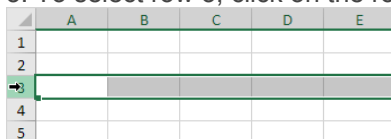
An Excel spreadsheet with columns A through E and rows 1 through 5. The cell at the intersection of column C and row 3 is highlighted with a green border and a small crosshair icon in the center, indicating it is the active cell.

2. To select column C, click on the column C header.



An Excel spreadsheet with columns A through E and rows 1 through 5. The entire column C is highlighted in light gray, indicating it is selected. A small crosshair icon is visible on the column C header.

3. To select row 3, click on the row 3 header.

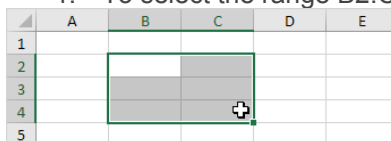


An Excel spreadsheet with columns A through E and rows 1 through 5. The entire row 3 is highlighted in light gray, indicating it is selected. A small crosshair icon is visible on the row 3 header.

## Range Examples

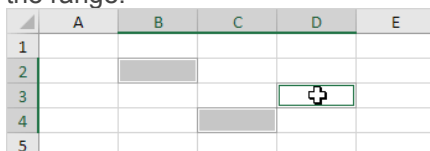
A range is a collection of two or more cells.

1. To select the range B2:C4, click on cell B2 and drag it to cell C4.



An Excel spreadsheet with columns A through E and rows 1 through 5. The range of cells from B2 to C4 is highlighted in light gray, indicating it is selected. A small crosshair icon is visible on cell C4.

2. To select a range of individual cells, hold down CTRL and click on each cell that you want to include in the range.



An Excel spreadsheet with columns A through E and rows 1 through 5. The cells B2, C3, and C4 are highlighted in light gray, indicating they are selected. A small crosshair icon is visible on cell C3.

## Fill a Range

To fill a range, execute the following steps.

1a. Enter the value 2 into cell B2.

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 |   |   |   |   |   |
| 2 |   | 2 |   |   |   |
| 3 |   |   |   |   |   |
| 4 |   |   |   |   |   |
| 5 |   |   |   |   |   |

1b. Select cell B2, click on the lower right corner of cell B2 and drag it down to cell B8.

|    | A | B | C | D | E |
|----|---|---|---|---|---|
| 1  |   |   |   |   |   |
| 2  |   | 2 |   |   |   |
| 3  |   |   |   |   |   |
| 4  |   |   |   |   |   |
| 5  |   |   |   |   |   |
| 6  |   |   |   |   |   |
| 7  |   |   |   |   |   |
| 8  |   |   |   |   |   |
| 9  |   |   |   |   |   |
| 10 |   |   |   |   |   |

Result:

|    | A | B | C | D | E |
|----|---|---|---|---|---|
| 1  |   |   |   |   |   |
| 2  |   | 2 |   |   |   |
| 3  |   | 2 |   |   |   |
| 4  |   | 2 |   |   |   |
| 5  |   | 2 |   |   |   |
| 6  |   | 2 |   |   |   |
| 7  |   | 2 |   |   |   |
| 8  |   | 2 |   |   |   |
| 9  |   |   |   |   |   |
| 10 |   |   |   |   |   |

This dragging technique is very important and you will use it very often in Excel. Here's another example.

2a. Enter the value 2 into cell B2 and the value 4 into cell B3.

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 |   |   |   |   |   |
| 2 |   | 2 |   |   |   |
| 3 |   | 4 |   |   |   |
| 4 |   |   |   |   |   |
| 5 |   |   |   |   |   |

2b. Select cell B2 and cell B3, click on the lower right corner of this range and drag it down.

|    | A | B  | C | D | E |
|----|---|----|---|---|---|
| 1  |   |    |   |   |   |
| 2  |   | 2  |   |   |   |
| 3  |   | 4  |   |   |   |
| 4  |   | 6  |   |   |   |
| 5  |   | 8  |   |   |   |
| 6  |   | 10 |   |   |   |
| 7  |   | 12 |   |   |   |
| 8  |   | 14 |   |   |   |
| 9  |   |    |   |   |   |
| 10 |   |    |   |   |   |

Excel automatically fills the range based on the pattern of the first two values. That's pretty cool huh!? Here's another example.

3a. Enter the [date](#) 6/13/2016 into cell B2 and the date 6/16/2016 into cell B3.

|   | A | B         | C | D | E |
|---|---|-----------|---|---|---|
| 1 |   |           |   |   |   |
| 2 |   | 6/13/2016 |   |   |   |
| 3 |   | 6/16/2016 |   |   |   |
| 4 |   |           |   |   |   |
| 5 |   |           |   |   |   |

3b. Select cell B2 and cell B3, click on the lower right corner of this range and drag it down.

|    | A | B         | C | D | E |
|----|---|-----------|---|---|---|
| 1  |   |           |   |   |   |
| 2  |   | 6/13/2016 |   |   |   |
| 3  |   | 6/16/2016 |   |   |   |
| 4  |   | 6/19/2016 |   |   |   |
| 5  |   | 6/22/2016 |   |   |   |
| 6  |   | 6/25/2016 |   |   |   |
| 7  |   | 6/28/2016 |   |   |   |
| 8  |   | 7/1/2016  |   |   |   |
| 9  |   |           |   |   |   |
| 10 |   |           |   |   |   |

Note: visit our page about [AutoFill](#) for many more examples.

## Move a Range

To move a range, execute the following steps.

1. Select a range and click on the border of the range.

|    | A | B  | C | D | E |
|----|---|----|---|---|---|
| 1  |   |    |   |   |   |
| 2  |   | 2  |   |   |   |
| 3  |   | 4  |   |   |   |
| 4  |   | 6  |   |   |   |
| 5  |   | 8  |   |   |   |
| 6  |   | 10 |   |   |   |
| 7  |   | 12 |   |   |   |
| 8  |   | 14 |   |   |   |
| 9  |   |    |   |   |   |
| 10 |   |    |   |   |   |

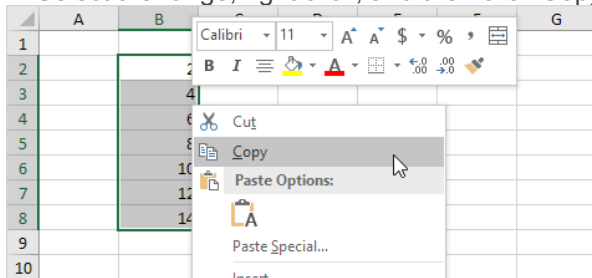
2. Drag the range to its new location.

|    | A | B | C | D  | E |
|----|---|---|---|----|---|
| 1  |   |   |   |    |   |
| 2  |   |   |   | 2  |   |
| 3  |   |   |   | 4  |   |
| 4  |   |   |   | 6  |   |
| 5  |   |   |   | 8  |   |
| 6  |   |   |   | 10 |   |
| 7  |   |   |   | 12 |   |
| 8  |   |   |   | 14 |   |
| 9  |   |   |   |    |   |
| 10 |   |   |   |    |   |

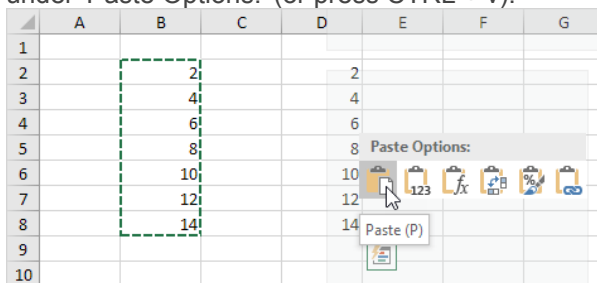
## Copy/Paste a Range

To copy and paste a range, execute the following steps.

1. Select the range, right click, and then click Copy (or press CTRL + c).



2. Select the cell where you want the first cell of the range to appear, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).



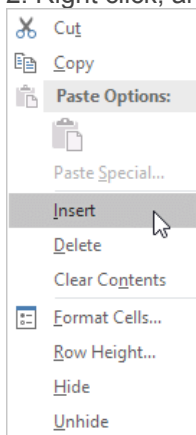
## Insert Row, Column

To insert a row between the values 20 and 40 below, execute the following steps.

1. Select row 3.

|   | A | B  | C | D | E |
|---|---|----|---|---|---|
| 1 |   |    |   |   |   |
| 2 |   | 20 |   |   |   |
| 3 |   | 40 |   |   |   |
| 4 |   | 60 |   |   |   |
| 5 |   |    |   |   |   |

2. Right click, and then click Insert.



Result:

|   | A | B  | C | D | E |
|---|---|----|---|---|---|
| 1 |   |    |   |   |   |
| 2 |   | 20 |   |   |   |
| 3 |   |    |   |   |   |
| 4 |   | 40 |   |   |   |
| 5 |   | 60 |   |   |   |
| 6 |   |    |   |   |   |

The rows below the new row are shifted down. In a similar way, you can insert a column.

## Formulas and Functions

Enter a Formula | Edit a Formula | Operator Precedence | Copy/Paste a Formula | Insert a Function

A formula is an expression which calculates the value of a cell. Functions are predefined formulas and are already available in Excel.

For example, cell A3 below contains a formula which adds the value of cell A2 to the value of cell A1.

|    |   |   |                                                                                                                                                                               |   |        |   |
|----|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------|---|
| A3 |   | : |   <i>fx</i> |   | =A1+A2 |   |
|    | A | B | C                                                                                                                                                                             | D | E      | F |
| 1  | 2 |   |                                                                                                                                                                               |   |        |   |
| 2  | 3 |   |                                                                                                                                                                               |   |        |   |
| 3  | 5 |   |                                                                                                                                                                               |   |        |   |
| 4  |   |   |                                                                                                                                                                               |   |        |   |

For example, cell A3 below contains the SUM function which calculates the sum of the range A1:A2.

|    |   |   |   |   |           |             |
|----|---|---|---|---|-----------|-------------|
| A3 |   | : |   |   | <i>fx</i> | =SUM(A1:A2) |
|    | A | B | C | D | E         | F           |
| 1  | 2 |   |   |   |           |             |
| 2  | 3 |   |   |   |           |             |
| 3  | 5 |   |   |   |           |             |
| 4  |   |   |   |   |           |             |

## Enter a Formula

To enter a formula, execute the following steps.

1. Select a cell.
2. To let Excel know that you want to enter a formula, type an equal sign (=).
3. For example, type the formula A1+A2.

On the Example, type the formula A1+A2:

| A3 | : |  |  | <i>fx</i> | =A1+A2 |   |
|----|---|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|--------|---|
|    | A | B                                                                                   | C                                                                                   | D         | E      | F |
| 1  | 2 |                                                                                     |                                                                                     |           |        |   |
| 2  | 3 |                                                                                     |                                                                                     |           |        |   |
| 3  | 5 |                                                                                     |                                                                                     |           |        |   |
| 4  |   |                                                                                     |                                                                                     |           |        |   |

Tip: instead of typing A1 and A2, simply select cell A1 and cell A2.

4. Change the value of cell A1 to 3.

|    |   |                          |   |   |   |   |
|----|---|--------------------------|---|---|---|---|
| A1 |   | ✕ ✓ <i>f<sub>x</sub></i> |   | 3 |   |   |
|    | A | B                        | C | D | E | F |
| 1  | 3 |                          |   |   |   |   |
| 2  | 3 |                          |   |   |   |   |
| 3  | 6 |                          |   |   |   |   |
| 4  |   |                          |   |   |   |   |

Excel automatically recalculates the value of cell A3. This is one of Excel's most powerful features!  
Edit a Formula

When you select a cell, Excel shows the value or formula of the cell in the formula bar.

|    |   |   |   |                      |        |   |
|----|---|---|---|----------------------|--------|---|
| A3 |   | ✕ | ✓ | <i>f<sub>x</sub></i> | =A1+A2 |   |
|    | A | B | C | D                    | E      | F |
| 1  | 2 |   |   |                      |        |   |
| 2  | 3 |   |   |                      |        |   |
| 3  | 5 |   |   |                      |        |   |
| 4  |   |   |   |                      |        |   |

1. To edit a formula, click in the formula bar and change the formula.

|       |        |   |   |   |                      |        |
|-------|--------|---|---|---|----------------------|--------|
| SUMIF |        | : | ✕ | ✓ | <i>f<sub>x</sub></i> | =A1-A2 |
|       | A      | B | C | D | E                    | F      |
| 1     | 2      |   |   |   |                      |        |
| 2     | 3      |   |   |   |                      |        |
| 3     | =A1-A2 |   |   |   |                      |        |
| 4     |        |   |   |   |                      |        |

2. Press Enter.

|    |    |   |   |                      |   |   |
|----|----|---|---|----------------------|---|---|
| A4 |    | ✕ | ✓ | <i>f<sub>x</sub></i> |   |   |
|    | A  | B | C | D                    | E | F |
| 1  | 2  |   |   |                      |   |   |
| 2  | 3  |   |   |                      |   |   |
| 3  | -1 |   |   |                      |   |   |
| 4  |    |   |   |                      |   |   |
| 5  |    |   |   |                      |   |   |

## Operator Precedence

Excel uses a default order in which calculations occur. If a part of the formula is in parentheses, that part will be calculated first. It then performs multiplication or division calculations. Once this is complete, Excel will add and subtract the remainder of your formula. See the example below.

|    |   |   |   |                      |           |   |
|----|---|---|---|----------------------|-----------|---|
| A4 |   | ✕ | ✓ | <i>f<sub>x</sub></i> | =A1*A2+A3 |   |
|    | A | B | C | D                    | E         | F |
| 1  | 2 |   |   |                      |           |   |
| 2  | 2 |   |   |                      |           |   |
| 3  | 1 |   |   |                      |           |   |
| 4  | 5 |   |   |                      |           |   |
| 5  |   |   |   |                      |           |   |

First, Excel performs multiplication ( $A1 * A2$ ). Next, Excel adds the value of cell A3 to this result. Another example,

|   |    |   |   |   |   |   |
|---|----|---|---|---|---|---|
|   | A4 |   |   |   |   |   |
|   |    |   |   |   |   |   |
|   | A  | B | C | D | E | F |
| 1 | 2  |   |   |   |   |   |
| 2 | 2  |   |   |   |   |   |
| 3 | 1  |   |   |   |   |   |
| 4 | 6  |   |   |   |   |   |
| 5 |    |   |   |   |   |   |

First, Excel calculates the part in parentheses ( $A2+A3$ ). Next, it multiplies this result by the value of cell A1.

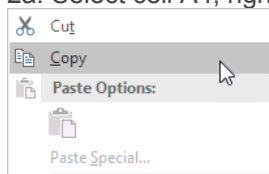
## Copy/Paste a Formula

When you copy a formula, Excel automatically adjusts the cell references for each new cell the formula is copied to. To understand this, execute the following steps.

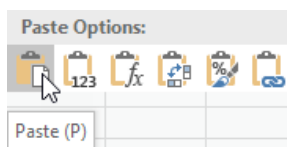
1. Enter the formula shown below into cell A4.

|   |    |   |   |   |   |   |
|---|----|---|---|---|---|---|
|   | A4 |   |   |   |   |   |
|   |    |   |   |   |   |   |
|   | A  | B | C | D | E | F |
| 1 | 2  | 5 |   |   |   |   |
| 2 | 2  | 6 |   |   |   |   |
| 3 | 1  | 4 |   |   |   |   |
| 4 | 6  |   |   |   |   |   |
| 5 |    |   |   |   |   |   |

2a. Select cell A4, right click, and then click Copy (or press CTRL + c)...



...next, select cell B4, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).



2b. You can also drag the formula to cell B4. Select cell A4, click on the lower right corner of cell A4 and drag it across to cell B4. This is much easier and gives the exact same result!

|   |    |   |   |   |   |   |
|---|----|---|---|---|---|---|
|   | A4 |   |   |   |   |   |
|   |    |   |   |   |   |   |
|   | A  | B | C | D | E | F |
| 1 | 2  | 5 |   |   |   |   |
| 2 | 2  | 6 |   |   |   |   |
| 3 | 1  | 4 |   |   |   |   |
| 4 | 6  |   |   |   |   |   |
| 5 |    |   |   |   |   |   |

Result. The formula in cell B4 references the values in column B.

|   |    |    |   |   |   |   |
|---|----|----|---|---|---|---|
|   | B4 |    |   |   |   |   |
|   |    |    |   |   |   |   |
|   | A  | B  | C | D | E | F |
| 1 | 2  | 5  |   |   |   |   |
| 2 | 2  | 6  |   |   |   |   |
| 3 | 1  | 4  |   |   |   |   |
| 4 | 6  | 50 |   |   |   |   |
| 5 |    |    |   |   |   |   |

## Insert a Function

Every function has the same structure. For example, SUM(A1:A4). The name of this function is SUM. The part between the brackets (arguments) means we give Excel the range A1:A4 as input. This function adds the values in cells A1, A2, A3 and A4. It's not easy to remember which function and which arguments to use for each task. Fortunately, the Insert Function feature in Excel helps you with this.

To insert a function, execute the following steps.

1. Select a cell.
2. Click the Insert Function button.

|   |    |   |   |   |   |   |
|---|----|---|---|---|---|---|
|   | D1 |   |   |   |   |   |
|   |    |   |   |   |   |   |
|   | A  | B | C | D | E | F |
| 1 | 3  | 8 | 6 |   |   |   |
| 2 | 10 | 5 | 4 |   |   |   |
| 3 |    |   |   |   |   |   |

The 'Insert Function' dialog box appears.

3. Search for a function or select a function from a category. For example, choose COUNTIF from the Statistical category.

Insert Function

Search for a function:

Type a brief description of what you want to do and then click Go

Go

Or select a category:

Statistical

Select a function:

COUNTA

COUNTBLANK

COUNTIF

COUNTIFS

COVARIANCE.P

COVARIANCE.S

DEVSQ

COUNTIF(range,criteria)

Counts the number of cells within a range that meet the given condition.

Help on this function

OK

Cancel

4. Click OK.
- The 'Function Arguments' dialog box appears.
5. Click in the Range box and select the range A1:C2.
6. Click in the Criteria box and type >5.
7. Click OK.

Function Arguments

**COUNTIF**

Range: A1:C2 = {3,8,6,10,5,4}

Criteria: >5 =

Counts the number of cells within a range that meet the given condition.

Criteria is the condition in the form of a number, expression, or text that defines which cells will be counted.

Formula result =

[Help on this function](#) OK Cancel

Result. The **COUNTIF** function counts the number of cells that are greater than 5.

|   | A  | B | C | D | E | F |
|---|----|---|---|---|---|---|
| 1 | 3  | 8 | 6 | 3 |   |   |
| 2 | 10 | 5 | 4 |   |   |   |
| 3 |    |   |   |   |   |   |

Note: instead of using the Insert Function feature, simply type `=COUNTIF(A1:C2,">5")`. When you arrive at: `=COUNTIF(` instead of typing A1:C2, simply select the range A1:C2.

## Subtract

There's no **SUBTRACT** function in Excel. However, there are several ways to subtract numbers in Excel. Are you ready to improve your Excel skills?

1. For example, the formula below subtracts numbers in a cell. Simply use the minus sign (-). Don't forget, always start a formula with an equal sign (=).

|   | A  | B | C | D | E | F | G | H | I |
|---|----|---|---|---|---|---|---|---|---|
| 1 | 93 |   |   |   |   |   |   |   |   |
| 2 |    |   |   |   |   |   |   |   |   |

2. The formula below subtracts the value in cell A2 and the value in cell A3 from the value in cell A1.

|   | A   | B | C | D | E | F | G | H | I |
|---|-----|---|---|---|---|---|---|---|---|
| 1 | 100 |   |   |   |   |   |   |   |   |
| 2 | 5   |   |   |   |   |   |   |   |   |
| 3 | 2   |   |   |   |   |   |   |   |   |
| 4 | 93  |   |   |   |   |   |   |   |   |
| 5 |     |   |   |   |   |   |   |   |   |

3. As you can imagine, this formula can get quite long. Simply use the **SUM** function to shorten your formula. For example, the formula below subtracts the values in the range A2:A9 from the value in cell A1.

|     |     |   |   |   |   |   |   |   |   |
|-----|-----|---|---|---|---|---|---|---|---|
| A10 |     |   |   |   |   |   |   |   |   |
|     |     |   |   |   |   |   |   |   |   |
|     | A   | B | C | D | E | F | G | H | I |
| 1   | 100 |   |   |   |   |   |   |   |   |
| 2   | 5   |   |   |   |   |   |   |   |   |
| 3   | 2   |   |   |   |   |   |   |   |   |
| 4   | 1   |   |   |   |   |   |   |   |   |
| 5   | 3   |   |   |   |   |   |   |   |   |
| 6   | 6   |   |   |   |   |   |   |   |   |
| 7   | 4   |   |   |   |   |   |   |   |   |
| 8   | 5   |   |   |   |   |   |   |   |   |
| 9   | 1   |   |   |   |   |   |   |   |   |
| 10  | 73  |   |   |   |   |   |   |   |   |
| 11  |     |   |   |   |   |   |   |   |   |

Take a look at the screenshot below. To subtract the numbers in column B from the numbers in column A, execute the following steps.

4a. First, subtract the value in cell B1 from the value in cell A1.

|    |    |   |    |   |   |   |   |   |   |
|----|----|---|----|---|---|---|---|---|---|
| C1 |    |   |    |   |   |   |   |   |   |
|    |    |   |    |   |   |   |   |   |   |
|    | A  | B | C  | D | E | F | G | H | I |
| 1  | 91 | 7 | 84 |   |   |   |   |   |   |
| 2  | 55 | 3 |    |   |   |   |   |   |   |
| 3  | 86 | 6 |    |   |   |   |   |   |   |
| 4  | 30 | 2 |    |   |   |   |   |   |   |
| 5  | 82 | 8 |    |   |   |   |   |   |   |
| 6  | 37 | 1 |    |   |   |   |   |   |   |
| 7  |    |   |    |   |   |   |   |   |   |

4b. Next, select cell C1, click on the lower right corner of cell C1 and drag it down to cell C6.

|    |    |   |    |   |   |   |   |   |   |
|----|----|---|----|---|---|---|---|---|---|
| C1 |    |   |    |   |   |   |   |   |   |
|    |    |   |    |   |   |   |   |   |   |
|    | A  | B | C  | D | E | F | G | H | I |
| 1  | 91 | 7 | 84 |   |   |   |   |   |   |
| 2  | 55 | 3 | 52 |   |   |   |   |   |   |
| 3  | 86 | 6 | 80 |   |   |   |   |   |   |
| 4  | 30 | 2 | 28 |   |   |   |   |   |   |
| 5  | 82 | 8 | 74 |   |   |   |   |   |   |
| 6  | 37 | 1 | 36 |   |   |   |   |   |   |
| 7  |    |   |    |   |   |   |   |   |   |
| 8  |    |   |    |   |   |   |   |   |   |

## Multiply

To multiply numbers in Excel, use the asterisk symbol (\*) or the PRODUCT function. Learn how to multiply columns and how to multiply a column by a constant.

4. Here's another example.

|    |          |   |   |   |   |   |   |   |   |
|----|----------|---|---|---|---|---|---|---|---|
| A8 |          |   |   |   |   |   |   |   |   |
|    |          |   |   |   |   |   |   |   |   |
|    | A        | B | C | D | E | F | G | H | I |
| 1  | 6        | 3 | 2 |   |   |   |   |   |   |
| 2  | 2        | 5 |   |   |   |   |   |   |   |
| 3  | 4        | 1 |   |   |   |   |   |   |   |
| 4  | 8        | 4 |   |   |   |   |   |   |   |
| 5  | 7        |   |   |   |   |   |   |   |   |
| 6  | 9        |   |   |   |   |   |   |   |   |
| 7  | 3        |   |   |   |   |   |   |   |   |
| 8  | 69672960 |   |   |   |   |   |   |   |   |
| 9  |          |   |   |   |   |   |   |   |   |

Explanation: =A1\*A2\*A3\*A4\*A5\*A6\*A7\*B1\*B2\*B3\*B4\*C1\*8 produces the exact same result. Take a look at the screenshot below. To multiply two columns together, execute the following steps.

## Divide

There's no DIVIDE function in Excel. Simply use the forward slash (/) to divide numbers in Excel.

The formula below divides 43 by 8. Nothing special.

|    |    |        |       |        |   |   |   |   |   |  |
|----|----|--------|-------|--------|---|---|---|---|---|--|
| C1 |    | ✕ ✓ fx |       | =A1/B1 |   |   |   |   |   |  |
|    | A  | B      | C     | D      | E | F | G | H | I |  |
| 1  | 43 | 8      | 5.375 |        |   |   |   |   |   |  |
| 2  |    |        |       |        |   |   |   |   |   |  |

5. You can use the QUOTIENT function in Excel to return the integer portion of a division. This function discards the remainder of a division.

|    |    |        |   |                  |   |   |   |   |   |  |
|----|----|--------|---|------------------|---|---|---|---|---|--|
| C1 |    | ✕ ✓ fx |   | =QUOTIENT(A1,B1) |   |   |   |   |   |  |
|    | A  | B      | C | D                | E | F | G | H | I |  |
| 1  | 43 | 8      | 5 |                  |   |   |   |   |   |  |
| 2  |    |        |   |                  |   |   |   |   |   |  |

6. The MOD function in Excel returns the remainder of a division.

|    |    |        |   |             |   |   |   |   |   |  |
|----|----|--------|---|-------------|---|---|---|---|---|--|
| C1 |    | ✕ ✓ fx |   | =MOD(A1,B1) |   |   |   |   |   |  |
|    | A  | B      | C | D           | E | F | G | H | I |  |
| 1  | 43 | 8      | 3 |             |   |   |   |   |   |  |
| 2  |    |        |   |             |   |   |   |   |   |  |

Take a look at the screenshot below. To divide the numbers in one column by the numbers in another column, execute the following steps.

## Square Root

The square root of a number is a value that, when multiplied by itself, gives the number. The SQRT function in Excel returns the square root of a number.

1. First, to square a number, multiply the number by itself. For example,  $4 * 4 = 16$  or  $4^2 = 16$ .

|    |   |        |   |       |   |   |   |   |   |  |
|----|---|--------|---|-------|---|---|---|---|---|--|
| B1 |   | ✕ ✓ fx |   | =A1^2 |   |   |   |   |   |  |
|    | A | B      | C | D     | E | F | G | H | I |  |
| 1  | 4 | 16     |   |       |   |   |   |   |   |  |
| 2  |   |        |   |       |   |   |   |   |   |  |

Note: to insert a caret ^ symbol, press SHIFT + 6.

2. The square root of 16 is 4.

|    |    |        |   |           |   |   |   |   |   |  |
|----|----|--------|---|-----------|---|---|---|---|---|--|
| B1 |    | ✕ ✓ fx |   | =SQRT(A1) |   |   |   |   |   |  |
|    | A  | B      | C | D         | E | F | G | H | I |  |
| 1  | 16 | 4      |   |           |   |   |   |   |   |  |
| 2  |    |        |   |           |   |   |   |   |   |  |

3. Instead of using the SQRT function, you could also use an exponent of 1/2. Don't forget the parentheses.

|    |    |        |   |           |   |   |   |   |   |  |
|----|----|--------|---|-----------|---|---|---|---|---|--|
| B1 |    | ✕ ✓ fx |   | =A1^(1/2) |   |   |   |   |   |  |
|    | A  | B      | C | D         | E | F | G | H | I |  |
| 1  | 16 | 4      |   |           |   |   |   |   |   |  |
| 2  |    |        |   |           |   |   |   |   |   |  |

4. If a number is negative, the SQRT function returns the #NUM! error.

|    |     |        |   |           |   |   |   |   |   |  |
|----|-----|--------|---|-----------|---|---|---|---|---|--|
| B1 |     | ✕ ✓ fx |   | =SQRT(A1) |   |   |   |   |   |  |
|    | A   | B      | C | D         | E | F | G | H | I |  |
| 1  | -16 | #NUM!  |   |           |   |   |   |   |   |  |
| 2  |     |        |   |           |   |   |   |   |   |  |

5. You can use the [ABS function](#) to remove the minus sign (-) from a negative number.

|    |     |   |   |   |   |   |   |   |   |                |  |
|----|-----|---|---|---|---|---|---|---|---|----------------|--|
| B1 |     |   |   |   |   |   |   |   |   | =SQRT(ABS(A1)) |  |
|    | A   | B | C | D | E | F | G | H | I |                |  |
| 1  | -16 | 4 |   |   |   |   |   |   |   |                |  |
| 2  |     |   |   |   |   |   |   |   |   |                |  |

Excel has no built-in function to calculate the nth root of a number. To calculate the nth root of a number, simply raise that number to the power of 1/n.

6. For example,  $5 * 5 * 5$  or  $5^3$  is 5 raised to the third power.

|    |   |     |   |   |   |   |   |   |   |   |  |   |  |    |  |       |  |
|----|---|-----|---|---|---|---|---|---|---|---|--|---|--|----|--|-------|--|
| B1 |   |     |   |   |   |   |   |   |   | X |  | ✓ |  | fx |  | =A1^3 |  |
|    | A | B   | C | D | E | F | G | H | I |   |  |   |  |    |  |       |  |
| 1  | 5 | 125 |   |   |   |   |   |   |   |   |  |   |  |    |  |       |  |
| 2  |   |     |   |   |   |   |   |   |   |   |  |   |  |    |  |       |  |

## Percentage

Calculating percentages in Excel is easy. Percentage simply means 'out of 100', so 72% is '72 out of 100' and 4% is '4 out of 100', etc.

### Enter a Percentage

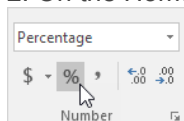
To enter a percentage in Excel, execute the following steps.

1. First, enter a decimal number.

First, enter a decimal number:

|    |      |      |   |   |   |   |   |   |   |
|----|------|------|---|---|---|---|---|---|---|
| A1 |      | 0.72 |   |   |   |   |   |   |   |
|    | A    | B    | C | D | E | F | G | H | I |
| 1  | 0.72 |      |   |   |   |   |   |   |   |
| 2  |      |      |   |   |   |   |   |   |   |

2. On the Home tab, in the Number group, click the percentage symbol to apply a Percentage format.



Result.

|         |     |     |   |   |   |   |   |   |   |
|---------|-----|-----|---|---|---|---|---|---|---|
| Result: |     |     |   |   |   |   |   |   |   |
| A1      |     | 72% |   |   |   |   |   |   |   |
|         | A   | B   | C | D | E | F | G | H | I |
| 1       | 72% |     |   |   |   |   |   |   |   |
| 2       |     |     |   |   |   |   |   |   |   |

Note: to change the percentage in cell A1, simply select cell A1 and type a new percentage (do not type a decimal number).

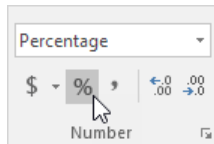
### Percentage of Total

To calculate the percentage of a total in Excel, execute the following steps.

1. Enter the formula shown below. This formula divides the value in cell A1 by the value in cell B1. Simply use the forward slash (/) as the division operator. Don't forget, always start a formula with an equal sign (=).

|    |    |    |          |   |   |   |   |   |   |        |  |  |  |  |  |  |  |  |  |
|----|----|----|----------|---|---|---|---|---|---|--------|--|--|--|--|--|--|--|--|--|
| C1 |    |    |          |   |   |   |   |   |   | =A1/B1 |  |  |  |  |  |  |  |  |  |
|    | A  | B  | C        | D | E | F | G | H | I |        |  |  |  |  |  |  |  |  |  |
| 1  | 20 | 60 | 0.333333 |   |   |   |   |   |   |        |  |  |  |  |  |  |  |  |  |
| 2  |    |    |          |   |   |   |   |   |   |        |  |  |  |  |  |  |  |  |  |

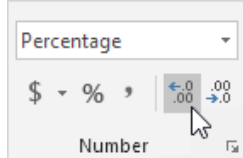
2. On the Home tab, in the Number group, click the percentage symbol to apply a Percentage format.



Result.

|   | A  | B  | C   | D | E | F | G | H | I |
|---|----|----|-----|---|---|---|---|---|---|
| 1 | 20 | 60 | 33% |   |   |   |   |   |   |
| 2 |    |    |     |   |   |   |   |   |   |

3. On the Home tab, in the Number group, click the Increase Decimal button once.



Result.

|   | A  | B  | C     | D | E | F | G | H | I |
|---|----|----|-------|---|---|---|---|---|---|
| 1 | 20 | 60 | 33.3% |   |   |   |   |   |   |
| 2 |    |    |       |   |   |   |   |   |   |

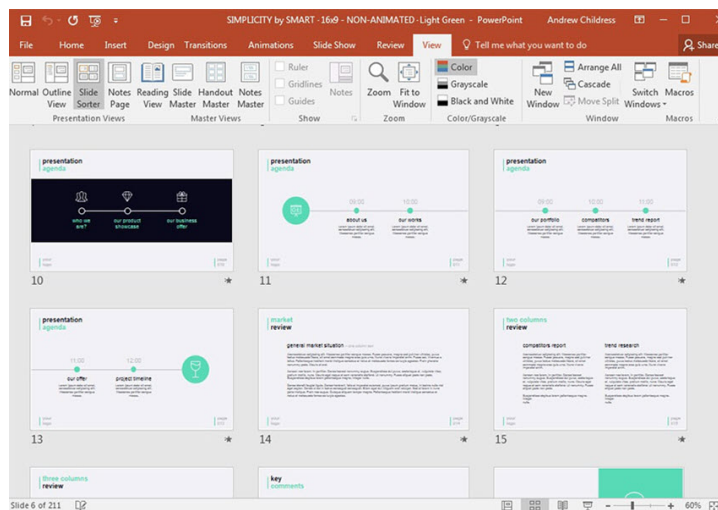
Note: Excel always uses the underlying precise value in calculations, regardless of how many decimals you choose to display.

## What Is PowerPoint?

**Microsoft PowerPoint** is undoubtedly the most popular app used to give presentations. You're likely to see PowerPoint presentations used for everything from the world's largest companies to grade school teachers sharing lessons.

PowerPoint is often the butt of the joke. Many decry PowerPoint as boring and a crutch for poorly-prepared speakers.

Only a bad carpenter blames the tools. And like any tool, PowerPoint is incredibly useful when used properly. You can use it as an aid on your speaking engagements to build comfort and drive points visually with your audience.



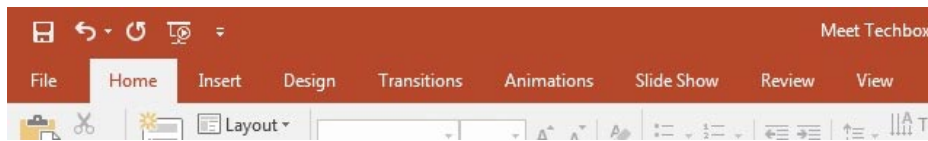
In this tutorial, we're going to focus on working inside of PowerPoint to build a presentation. This PowerPoint guide has everything you need to get comfortable in the app. To master the app, we'll talk about and cover the most common steps a rookie PowerPoint user needs to know.

Here are the key actions you'll need to take to build a PowerPoint presentation:

- You'll need to add **slides**, the individual pages in the presentation.
- You'll add **content** to the slides, such as text boxes, images, charts and graphs.
- Change **themes and styles** to make your presentation look professional and fit the occasion at hand.
- Prepare presentation aids like **Speaker Notes** and **Presenter View** to help you feel comfortable with presenting.

### 1. The Ribbon

The ribbon menu is found across many of Microsoft's apps, such as Word, Excel, and PowerPoint. It lives above the main area of the application.



The PowerPoint ribbon lets you switch between various tabs.

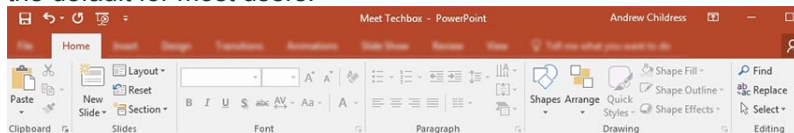
The ribbon contains a series of tabs that you can switch between. Each of these have a unique set of tools to work with your presentation differently. When you switch tabs on the ribbon, you'll see new buttons and options to modify your presentation:

- **File.** Save, share, and export your presentation.
- **Home.** A general purpose collection of the most common tools that you'll use in PowerPoint.
- **Insert.** An all-in-one tool to add every imagine-able type of content, such as tables, pictures, charts, video, and more.
- **Design.** Controls the overall look and feel of your presentation with theme and style settings.
- **Transitions.** Add animations when you switch slides.
- **Animations.** Controls the order and style that objects will enter or exit your slide with.
- **Slide Show.** Control settings related to the way your presentation appears when sharing it with an audience.

## 2. The Home Tab

**Use it for:** a general selection of the most popular tools in PowerPoint.

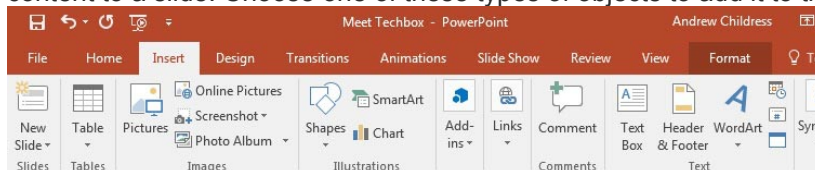
I usually stay on the **Home** tab when I'm working in PowerPoint. The reason is because it has practically every tool you need. From adding a new slide to changing text and paragraph settings, the **Home** tab is the default for most users.



The **Home** tab has many of the most commonly used tools, all in one bar.

## 3. The Insert Tab

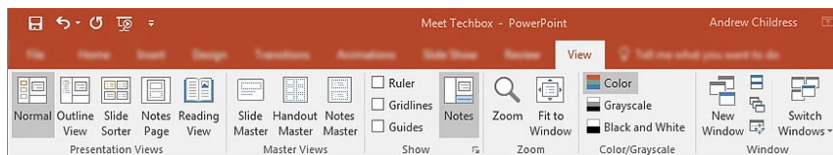
When you're working on adding content to a slide, the **Insert** tab has every possible tool to add new content to a slide. Choose one of these types of objects to add it to the slide.



The **Insert** tab has the tools you need to add tables, pictures, charts, and more.

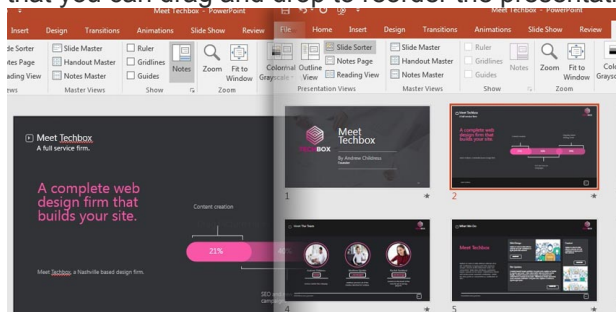
## 4. Views

PowerPoint has a variety of views which are simply different ways to work with the same presentation. You can change the view in order to get a different perspective on your content. Use views for a different way to edit and build your PowerPoint presentation.



The **Views** tab changes the perspective on your PowerPoint presentation.

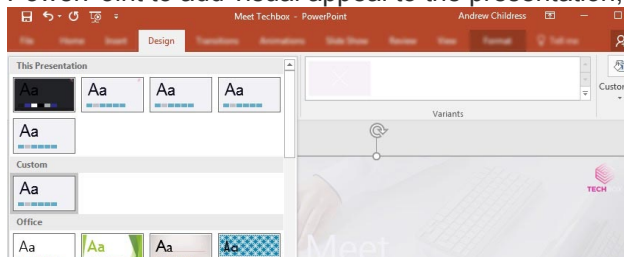
In the screenshot below, you can see the difference between the default **Normal** view and **Slide Sorter** view. **Normal** view shows each slide front and center, while slide sorter view creates thumbnails that you can drag and drop to reorder the presentation.



**Normal** view is the default presentation view in PowerPoint, while an alternate view like **Slide Sorter** allows you to re-sequence your presentation by dragging and dropping the slide thumbnails.

## 5. The Design Tab

An attractive presentation can really grab your audience's attention. We use themes and styles in PowerPoint to add visual appeal to the presentation, and the **Design** tab really controls these settings.



Click on one of the theme thumbnails to transform the look and feel of the presentation.

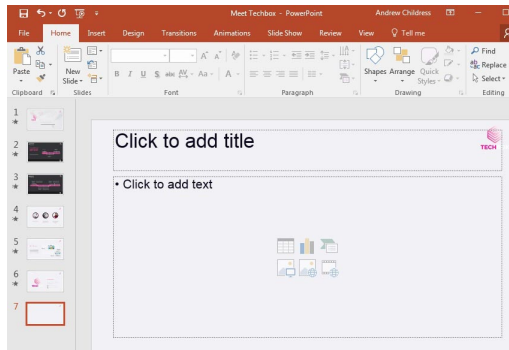
On the **Design** tab, you can click on one of the themes to restyle the presentation. Or, try out a different Style thumbnail to overhaul the color theme.

## The Steps to Create a PowerPoint Presentation for Beginners

We've tackled the interface of PowerPoint, so you should be feeling pretty comfortable with how to get around the app. Now, let's talk about the actions you'll find yourself using repeatedly and how you can do that in PowerPoint.

### 1. How to Add Slides

Think of **slides** as the individual units in your presentation that you can fill with content. To insert a new slide, go to the **Insert** tab on PowerPoint's ribbon. Then, click on the **New Slide** button to add a new slide to your presentation.



A new slide will have basic placeholders to add your content to in PowerPoint.

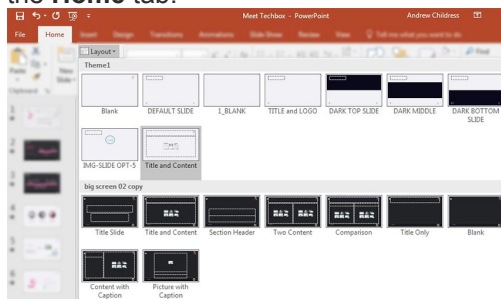
Each of the thumbnails that you'll see on the sidebar represents a slide. Then, you'll add content to each slide.

There's no practical limit to the number of slides that your PowerPoint file can contain. However, you should consider how many slides it actually takes to make your point. It's often the

## 2. How to Add Content

Content is what defines each and every slide. PowerPoint accommodates a wide range of content like text, graphs, tables, charts, and more.

The easiest way to add content is to start off by choosing a **Layout**, which you can choose from the **Home** tab.

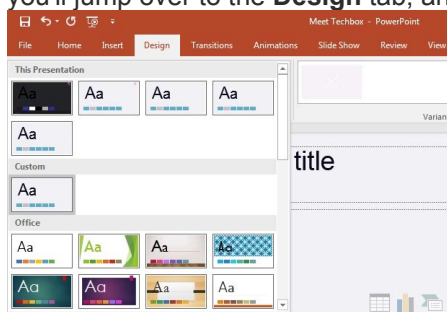


Various PowerPoint layouts shown on the **Home** tab.

These layouts have content boxes that are easy to add your own content to. Simply choose a layout, and then start adding your content.

## 3. How to Choose a Theme and Style

After you build out your presentation's content, it's a great idea to think about adding visual style. For this, you'll jump over to the **Design** tab, and click on one of the thumbnails for a theme.



Use the **Design** tab to pick a theme.

Using a PowerPoint theme is the preferred alternative to adding backgrounds, color and type styles to each and every slide. Changing the theme typically will adjust the entire presentation simultaneously. This greatly reduces the time involved with building a presentation.

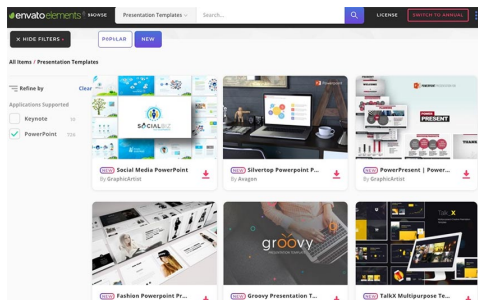
With just these three steps, you have the repeatable sequence of actions needed to build a presentation.

## How to Power up PowerPoint

With every creative app I've ever learned, there are always those insider tricks of the trade that you learn many months later. They make you wish that you had known them all along and think about the many hours you wasted on the learning curve.

PowerPoint is no exception to this rule, and it's especially important that you can cut to the chase when you're rushing to prepare for your presentation.

The best way to save time on your presentation is to start with a **pre-built PowerPoint theme**. And you can find those on [Envato Elements](#), which is an unlimited download service for creatives.

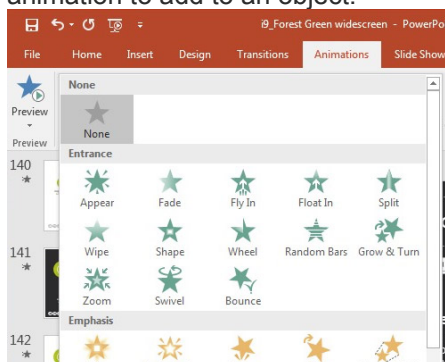


## Add PowerPoint Object Animations

**Object animations** bring elements onto or off a PowerPoint slide. You can use these effects to reveal key points or draw attention to a specific part of the slide. Imagine leaving the conclusion for each slide hidden until you press a button on your remote, for example.

To get started with object animations, start off by clicking on an element on your slide. You can choose an element like a text box, image, or even a shape you've drawn on the slide.

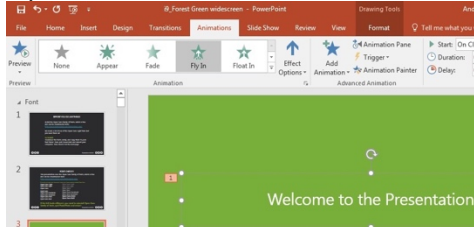
Now, click on the **Animations** tab on PowerPoint's ribbon. This menu makes it easy to choose an animation to add to an object.



On the **Animations** tab, you can simply click on one of the animation thumbnails to apply it to a selected object.

Click on the part of the slide that you want to animate. Again, this could be a text box, image, chart, or any object that you can select on the slide.

Once you have an object selected, simply click on one of the animation thumbnails. PowerPoint will play a preview of the selected animation and you'll see the object come onto the slide.



In this screenshot, you can see that I've selected a text box and chosen the **Fly In** effect to add to the text box.

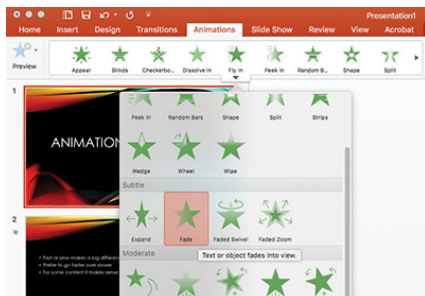
Now, simply click on the animation that you want to add to an object. I recommend choosing a simple animation effect like **Fade** or **Appear**. Keeping an animation simple will bring it onto a slide naturally and not distract the audience.

### Sequence Object Animations in PowerPoint

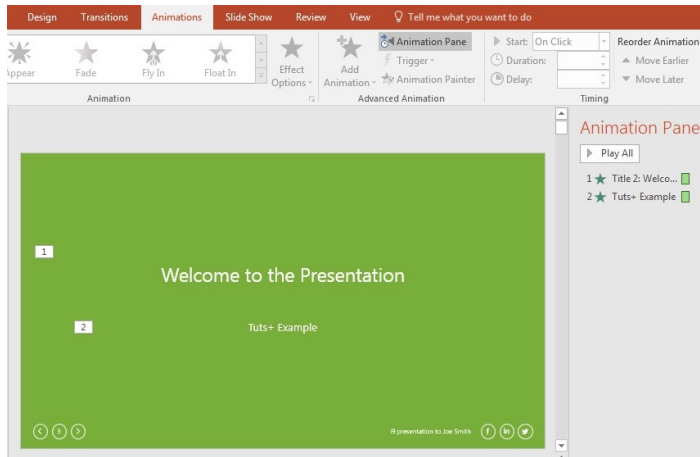
If you've added multiple animations to the same slide, you might want to re-order the object animations. For instance, your images might come onto a slide before the title appears.

In this case, it helps to **resequence animations**. To reorder animations, switch to the **Animations** tab on PowerPoint's ribbon.

Then, find the **Animation Pane** button and click on it to open up a panel that shows all of the animations on the slide.



- On the right side, you'll see the **Animation Pane** open, and you'll see a list of animations that will play on the slide. In the example below, you can see two animations on the side, each of which represents an object's animation.

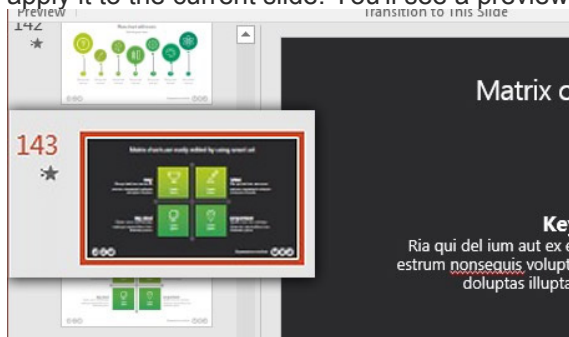


The numbers next to objects represent the order that the animations will play. To reorder the animations, simply drag and drop them in the list on the Animation Pane. You can click **Play All** to preview the animations once they are reordered.

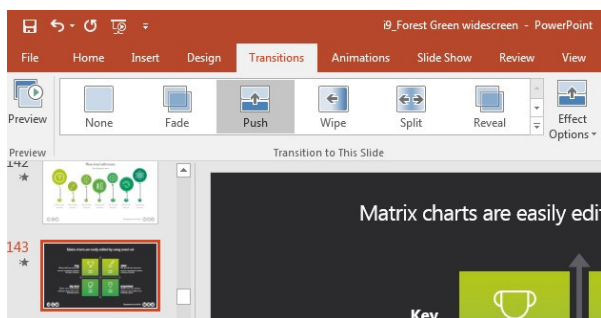
### Add PowerPoint Slide Transitions

Slide transitions show as effects when you move from one slide to the next. These are another form of animation you can apply with relative ease.

To apply a slide transition, start off by selecting a slide and clicking on Transitions on PowerPoint's ribbon. With a slide selected, you can simply click on one of the animation thumbnails on the ribbon to apply it to the current slide. You'll see a preview of the active transition animation play.



The small star icon next to the slide thumbnail shows slides that have transition effects applied to them. Notice that slides that have animations show a small icon in the sidebar, so you can easily identify the slides that you've applied transitions to. You can always click the **Preview** button to play the animation on the active slide.



On the **Transitions** slide on PowerPoint's ribbon, you can simply click on the thumbnail for an animation to apply it to a slide.

There are three other key options that you can set on the ribbon for each slide's transition:

- **Sound** - Choose a dropdown option to play a sound when the slide advances.
- **Duration** - This describes the duration (speed) that the animation plays. You can set a longer duration in seconds for the animation to play more slowly, or shorten it for a faster transition.
- **Advance Slide** - Instead of advancing the slide by clicking through the presentation, you can tick the "After" option to automatically change slides after a certain amount of time.

The principles of limiting animation and effects are the same for slide transitions: use them sparingly, and stick to the simple dissolve or fade effects. PowerPoint presentations are just an aid to showcase your content and shouldn't distract from the content itself.