

Lesson 2-6: Working with Absolute and Relative Cell References

Figure 2-10

Use AutoFill to copy a formula to other cells.

Figure 2-11

Relative vs. Absolute references.

Beginning	Ending	Total Miles	Amount
20478	20568	90	28.8
21004	21364	360	
21435	21707		
21801	21891		
21956	22266		
22478	22838		
23481	24001		
24100	24620		
24850	25122		

Figure 2-10

	A	B	C
1		Relative Cell Reference	Absolute Cell Reference
2		=A1	=A\$1
3	100	=A2	=A\$1
4	500	=A3	=A\$1
5	300	=A4	=A\$1
6	600		

Relative cell references are based on their position relative to the cell that contains the formula. The cell references change if the cell is moved to a new location.

Absolute cell references always refer to a particular cell address. They do not change if the cell is moved to a new location.

Figure 2-11

One of the more difficult Excel concepts you need to understand is the difference between *relative* and *absolute* cell references. You should already know that a cell reference identifies a cell or a range of cells on a worksheet and tells Microsoft Excel where to look for values you want to use in a formula. Here is the description and differences between absolute and relative cell references:

- **Relative:** Relative references tell Excel how to find another cell starting from the cell that contains the formula. Using a relative reference is like giving someone directions that explain where to go from where the person is currently standing. When a formula containing relative references is moved, it will reference new cells based on their location to the formula. Relative references are the default type of references used in Excel.
- **Absolute:** Absolute references always refer to the same cell address, even if the formula is moved.

If you're continuing from the previous Copying and Pasting lessons you can skip the first step of this exercise, otherwise you will need to open the Lesson 2B file...

1. If necessary, open the workbook named **Lesson 2B** on your Practice disk or folder then save it as **Mileage Report**.

If you do not know where your practice files are located, ask your instructor for assistance. First we need to create a simple formula...

2. Click cell **E5**, type the formula **=D5-C5** and press **<Enter>**.

You've just created a simple formula that finds out the number of miles driven to a location by subtracting the beginning mileage from the ending mileage. Instead of retyping the total miles formula for every one of the destinations, you can copy the formula using any of the copy and paste methods you've already learned. The easiest and fastest way of copying the formula to the other cells is using the AutoFill function.

3. Click cell **E5** and position the pointer over the fill handle of cell **E5**, until it changes to a **+**, click and hold the mouse and drag the fill handle down to cell **E12** and release the mouse button, as shown in Figure 2-10.

Poof! AutoFill copies the formula you entered in cell E5 to the cells you selected, saving you a lot of time you would have spent if you manually entered the formulas yourself. Now let's take a look at what is meant by a *relative cell reference*.

4. Click cell **E6** to make it active.

Look at the formula bar. The formula that Excel copied to this cell isn't exactly the one you entered in cell E5. Instead of the original formula you entered, =D5-C5, this cell contains the formula =D6-C6. Excel copied the formula, but substituted new cell references so that even though the location of the cell has changed, its relationship with the cells in the formula hasn't. This is an example of *relative cell addresses*—they are based on their position relative to the cell that contains the formula.

Relative cell addresses are almost always the best way to reference other cells in formulas, which is why they are the default way Excel uses to reference cells. Sometimes, however, you might want a cell reference to always refer to a particular cell address. In this case, you would use an *absolute cell reference*, which always refers to a specific cell address, even if you move the formula to a new location. Create another formula to see how to use an absolute cell reference.

5. Select cell **F5**, type **=**, click cell **E5** (the total miles), type ***** (the multiplication operator), click cell **F2** (the cost per mile), and complete the formula by pressing **<Enter>**.

Great! You've just created a formula that multiplies the totals miles driven by the cost per mile, currently .32. Now use AutoFill to copy the formula to the other cells.

6. Position the pointer over the fill handle of cell **F5**, until it changes to a **+**, click and hold the mouse and drag the fill handle down to cell **F12** and release the mouse button.

Excel copies the formula, but what went wrong? Let's take a look.

7. Click cell **F6** to make it active.

Look at the formula bar. The formula, =E6*F3, that Excel copied to this cell is not correct. Look at cell F3—there's nothing there to multiply (unless you consider the text label), hence the #VALUE! error message. You need to use an *absolute reference* so the formula always refers to cell F2, even if a formula is moved or copied.

8. Click cell **F5** to make it active and click anywhere in the Formula bar to change to Edit mode.

9. Verify that the insertion point is touching the **F2** in the formula and press the **<F4>** key.

Dollar signs appear, changing the F2 reference to \$F\$2—indicating it is an absolute reference. You can create an absolute reference to a cell by placing a dollar sign (\$) before the parts of the reference that do not change. To create an absolute reference to cell A1, for example, add dollar signs to the formula: \$A\$1. Pressing <F4> changes a relative cell reference to an absolute cell reference.

10. Press **<Enter>** and repeat **Step 6** to copy the formula to the other cells.

This time the formula is copied correctly. The first cell reference in the formula is relative and changes based on the formula's location. The second cell reference in the formula, (\$F\$2), on the other hand, is an absolute cell reference and always points to cell F2, regardless of the formula's location.



Fill Handle

A1

Relative
Reference

\$A\$1

Absolute
Reference

Press the <F4> key when clicking a cell to create an absolute cell reference to it.

Quick Reference

To Create an Relative Reference in a Formula:

1. Click the cell you want to reference, for example click cell B4.
Or...

2. Type the address of the cell, for example type B4.

To Create an Absolute Reference in a Formula:

1. Press and hold the <F4> key as you click the cell you want to reference.
Or...

2. Type the address of the cell with \$ (dollar signs) before every reference heading. (For example, type \$B\$4).