Lesson 3-2: Working with Relative and Absolute Cell References

Figure 3-4

Using a relative cell reference.

Figure 3-5

Using an absolute cell reference.

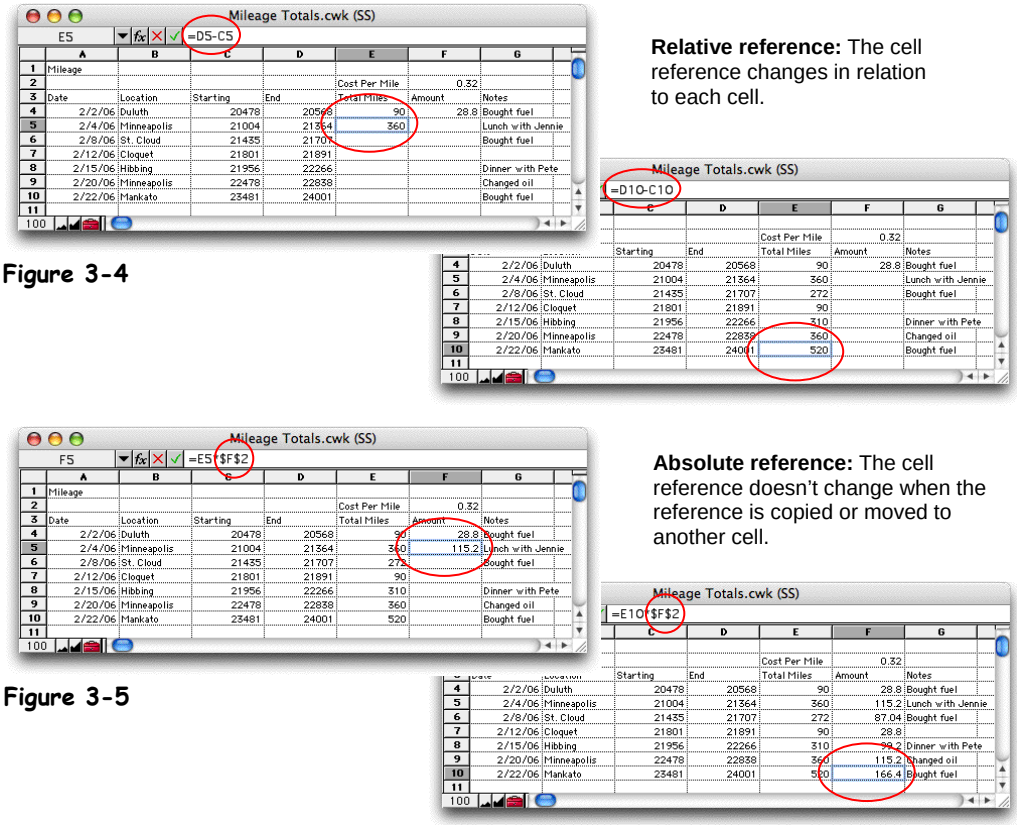

Figure 3-4

Figure 3-5

Formulas can contain explicit values, such as the numbers 4 or 5, but more often they will reference the values contained in other cells. For example, the formula =A3+A4 adds together whatever values are in cells A3 and A4.

Absolute references are created by placing a dollar sign ($) before the parts of the reference that do not change.

One of the more difficult spreadsheet concepts you need to understand is the difference between *relative* and *absolute* cell references. You already know that a cell reference identifies a cell or a range of cells on a spreadsheet and tells AppleWorks where to look for values you want to use in a formula. Following are descriptions of absolute and relative cell references:

- **Relative:** Relative references tell 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 or copied, it references new cells based on their location to the formula. Relative references are the default reference type in AppleWorks.
- **Absolute:** Absolute references always refer to the same specific cell address, even if the formula is moved.

1. Open the Lesson 3B spreadsheet file and save it as `Mileage Totals`.

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 <Return>.

You've just created a simple formula that finds out the number of miles driven to a location by subtracting the starting 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, or you can use the fill feature, which we'll try out here.

3. Select the cell range E5..E10 and select Calculate → Fill Down from the menu.

Poof! The Fill command copies the formula you entered in cell E5 to the cells you selected, saving you a lot of time over manually entering the formulas. Now let's take a closer 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 AppleWorks 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. AppleWorks 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.

A1
Relative Reference
A1
Absolute Reference

Relative cell addresses are usually the best way to reference other cells in formulas, which is why they are the default way for referencing cells. 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 <Return>.

The formula multiplies the total miles driven by the cost per mile, currently .32. Now use the Fill command to copy the formula to the other cells.

6. Select the cell range F5..F10 and select Calculate → Fill Down from the menu.

AppleWorks 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 was 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. You can create an absolute reference to a cell by placing a dollar sign ($) before the parts of the reference that do not change.

8. Click cell F5, then click in the Entry bar just to the left of F2. Type a $ and then type another $ between the F and the 2. Press <Return>.

The cell reference now appears as F2—indicating that it is an absolute reference.

9. Select the cell range F5..F10 and select Calculate → Fill Down from the menu.

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 (F2), on the other hand, is an absolute cell reference and always points to cell F2, regardless of the formula's location.

10. Save and close the spreadsheet.

Quick Reference

To Create a Relative Reference in a Formula:

- Click the cell you want to reference.

  Or…

- Type the address of the cell. (For example, B4.)

To Create an Absolute Reference in a Formula:

- Type the address of the cell with $ (dollar signs) before every reference heading. (For example, B4.)