Lesson 5: Using Functions

## Step-by-Step 1 – Explore Functions

**GET READY. Launch Excel and open a new, blank workbook.**

**1.** To become familiar with the tools available to build formulas and insert functions, click the **FORMULAS** tab. Excel arranges functions by category in the Function Library group, such as Financial, Logical, Text, and so on. Click the **Financial** button arrow to display a drop-down list of functions. If you create a financial function, you can simply scroll through the list and select the function you want.

**2.** You can also find a function using the Insert Function dialog box. On the FORMULAS tab or on the formula bar, click the **Insert Function** button.

**3.** In the Insert Function dialog box, type a description of what you want to do. For example, type **date** and click **Go**. Excel returns a list of functions that most closely match your description.

**4.** With DATE selected in the Select a function list, click **OK**. The Function Arguments dialog box opens.

**5.** Enter the current year, the number of the current month, and the number of the current day (see Figure 5-5). Click **OK**. The date is entered into the worksheet in cell A1.

**6. SAVE** the workbook to your Lesson 5 folder as ***05 Practice Solution***.

**Pause. leave the workbook open to use in the next exercise.**

## Step-by-Step 2 – Explore Dates

**GET READY. USE the workbook you created in the previous exercise.**

**1.** In cell A2, type **1/10/1900** and press **Enter**.

**2.** Select cell **A2**.

**3.** On the HOME tab, in the Number group, open the **Number Format** menu and select **General**. The value in A2 changes to *10* (see Figure 5-6). When you enter a date manually into Excel, the format of the cell automatically changes to Date. Because the date 1/10/1900 is the tenth day after (and including) January 1, 1900, the value is 10. Excel’s Date format displays the value as a date, and the General format displays the value as a number.

**4.** With A2 still selected, change the number format to **Short Date** using the Number Format menu. The cell displays *1/10/1900*.

**5.** Click cell **A3**, type **40000** and press **Enter**. Because the cell is formatted as General by default, the value appears as a number.

**6.** Click cell **A2**.

**7.** On the HOME tab, in the Clipboard group, click the **Format Painter**, and then click cell **A3**. The formatting of A2 is copied to A3. The value in A3 now appears as a date: *7/6/2009.*

**8.** In cell A4, type **=A3-A2** and press **Enter**. The result is *39990*, which is the number of days between the two dates.

**9.** SAVE the workbook.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 3 – Use the TODAY Function

GET READY. USE the workbook you modified in the previous exercise.

**1.** In cell A5, type **=TODAY()** and press **Enter**. The current date displays.

**2.** SAVE the workbook.

Pause. Leave the workbook open to use in the next exercise.

## Step-by-Step 4 – Use the NOW Function

**GET READY. USE the workbook you modified in the previous exercise.**

**1.** In cell A6, type **=NOW()** and press **Enter**. The column width automatically expands, and the current date and time display.

**2.** Copy cell **A6** to **A7**.

**3.** Select cell **A7**.

**4.** On the HOME tab, in the Number group, from the Number Format menu, select **Time**. The current time without the date appears in A7.

**5.** SAVE the workbook and CLOSE it.

**Pause. Leave Excel open to use in the next exercise.**

## Step-by-Step 5 – Use the SUM Function

**GET READY. Launch Excel if it is not already running.**

**1.** OPEN the ***05 Budget Start*** data file for this lesson. Click **Enable Editing**, if prompted. This workbook is similar to the ***04 Budget Start*** workbook used in Lesson 4, but with modifications to accommodate the current lesson.

**2.** In cell B7, type **=SUM(B3:B6)** and press **Enter**. The result, 2140, is the sum of January nonutility expenses.

*If you get an error message when entering a basic Excel formula, remember that all formulas must start with an equal sign (=). A function is simply a predefined formula, so you must use the equal sign.*

**3.** Click in cell **C7**. Click the **FORMULAS** tab and then click the top part of the **AutoSum** button. The SUM function appears with arguments filled in, but only C6 is included. Type **C3:** before C6 to correct the range (see Figure 5-10). Press **Enter**. The result, 1340, is the sum of February nonutility expenses.

**4.** Copy cell **C7** to **D7:M7** to enter the remaining subtotals.

**5.** Copy cell **N6** to **N7** to enter the total nonutility expenses.

**6.** SAVE the workbook to your Lesson 5 folder as ***05 Budget Math Solution***.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 6 – Use the COUNT Function

**1.** USE the workbook you modified in the previous exercise.

**2.** In cell O5, type **Count** and press **Enter**. This is the label identifying the formula you will enter in the next step.

**3.** In cell O6, type **=COUNT(B6:M6)** and press **Enter**. The result, *9*, is the number of months in which you budgeted for miscellaneous expenses.

**4.** SAVE the workbook.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 7 – Use the COUNTA Function

**GET READY. USE the workbook you modified in the previous exercise.**

**1.** In cell P5, type **CountA** and press **Enter**. This is the label identifying the formula you will enter in the next step.

**2.** In cell P6, on the formula bar, click the **Insert Function** button.

**3.** In the Insert Function dialog box, in the Search for a function text box, type **counta** and then click **Go**.

**4.** Select **COUNTA** in the results list and click **OK**. The Function Arguments dialog box opens.

**5.** Click **Collapse Dialog**. The box collapses to a single entry box.

**6.** Select **A6:M6**. The new range appears in the dialog box.

**7.** Click **Expand Dialog**, and click **OK** to close the dialog box. The result, *10*, is the number of nonblank cells in the range.

**8.** SAVE the workbook.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 8 – Use the AVERAGE Function

**GET READY. USE the workbook you modified in the previous exercise.**

**1.** In cell O8, type **Average** and press **Enter**.

**2.** In cell O9, type **=AVERAGE(B9:M9)** and press **Enter**. The result, *175.8333,* is your average expected monthly electricity bill.

**3.** In cell O10, type **=AVERAGE(B10:M10)** and press **Enter**. The result, *93.33333*, is your average expected monthly gas bill.

**4.** SAVE the workbook.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 9 – Use the MIN Function

**GET READY. USE the workbook you modified in the previous exercise.**

**1.** In cell P8, type **Min** and press **Enter**.

**2.** Click in cell **P9** and then click the **FORMULAS** tab.

**3.** Click the **AutoSum** button arrow, and then select **Min** from the menu. The range B9:O9 is automatically selected (see Figure 5-15). This range is incorrect, so you need to edit it.

**4.** Click cell **B9**, hold down the **Shift** key, and click cell **M9**. The range B9:M9 appears in the function, which now looks like =MIN(B9:M9). See Figure 5-16. Press **Enter**. The result, *150,* appears, which is the lowest expected electricity bill for the year.

**5.** Copy cell **P9** to cell **P10**. The result, *70*, is the lowest expected gas bill for the year.

**6.** SAVE the workbook.

**Pause. Leave the workbook open to use in the next exercise.**

Step-by-Step 10 – Use the MAX Function

GET READY. USE the workbook you modified in the previous exercise.

**1.** In cell Q8, type **Max** and press **Enter**.

**2.** In cell Q9, type **=MAX(B9:M9)** and press **Enter**. The result, *230*, is the highest monthly electricity bill that you expect to receive.

**3.** Copy cell **Q9** to **Q10**. The result, *120*, is the highest monthly gas bill that you expect to receive.

**4.** SAVE the workbook to your Lesson 5 folder and CLOSE it.

**Pause. Leave Excel open to use in the next exercise.**

## Step-by-Step 10 – Use the PMT (Payment) Function

**GET READY. Launch Excel if it is not already running.**

**1.** OPEN the ***05 Budget PMT*** data file for this lesson.

**2.** In cell R2, type **Electronics** and press **Enter**.

**3.** In cell R3, type **Interest** and press **Enter**.

**4.** In cell R4, type **Years** and press **Enter**.

**5.** In cell R5, type **Loan Amt** and press **Enter**.

**6.** In cell R6, type **Payment** and press **Enter**.

**7.** In cell S3, type **7.5%** and press **Enter**. This is the interest rate on the loan.

**8.** In cell S4, type **2** and press **Enter**. This is the number of years in which the loan will be repaid.

**9.** In cell S5, type **2500** and press **Enter**. This is the loan amount, which will cover the total cost of the equipment.

**10.** In cell S6, type **=–PMT(S3/12,S4\*12,S5)** and press **Enter**. The result, *$112.50*, is your calculated monthly payment

**11.** SAVE the workbook to your Lesson 5 folder as ***05 Budget PMT Solution*** and CLOSE it.

Pause. Leave Excel open to use in the next exercise.

## Step-by-Step 11 – Select and Create Ranges for Subtotaling

**GET READY. Launch Excel if it is not already running.**

**1.** OPEN the ***05 Budget Subtotals*** data file for this lesson.

**2.** Select **B7:M7**.

**3.** On the FORMULAS tab, in the Defined Names group, click the **Define Name** button. The New Name dialog box opens.

**4.** In the Name text box, verify that Nonutility\_Subtotals appears (see Figure 5-19). Click **OK**. This names a range for the nonutility subtotal figures.

**5.** SAVE the workbook to your lesson 5 folder as ***05 Budget Subtotals Solution***.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 12 – Build Formulas to Subtotal

**GET READY. USE the workbook you modified in the previous exercise.**

*This lesson shows you how to build subtotals using the SUBTOTAL function. Lesson 9 , “Working with Data and Macros,” covers grouping and outlining to produce subtotals.*

**1.** In cell B17, type **=SUBTOTAL(9,B7,B16)**, as shown in Figure 5-20. Press **Enter**. This formula adds the nonutility subtotal and utility subtotal for January.

**2.** Copy cell **B17** to **C17:M17**. All monthly subtotals are entered.

**3.** In cell N17, type **=SUBTOTAL(9,B7:M7,B16:M16)**. Press **Enter**. This formula adds all nonutility and utility expenses for the year.

**4.** SAVE the workbook.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 13 – Modify Ranges for Subtotaling

**GET READY. USE the workbook you modified in the previous exercise.**

**1.** In cell N17, notice that the result of the current formulas is *24,230*.

**2.** Use the formula bar to modify the formula in N17 like this: **=SUBTOTAL(9,Nonutility\_Subtotals,Utility\_Subtotals)**. Press **Enter**. This formula replaces the cell ranges with named ranges to add all nonutility and utility expenses for the year, and the result remains the same at *24,230*.

**3.** Click in cell **B19** and then click in the formula bar. Change the formula from =SUM(Q1Expenses) to **=SUBTOTAL(9,Q1Expenses)**. This cell sums the named range Q1Expenses. Because the named range includes monthly data and subtotals, you need to correct the range to include only subtotal figures.

**4.** On the FORMULAS tab, in the Defined Names group, click **Name Manager**.

**5.** Select **Q1Expenses** in the list and click **Edit**. The Edit Name dialog box opens.

**6.** Highlight everything in the Refers to text box and press **Backspace** to delete it.

**7.** Click cell **B7**, press and hold the **Shift** key, and click **D7**. The range B7:D7 is highlighted.

**8.** Press and hold the **Ctrl** key while clicking cells **B16**, **C16**, and **D16**.

**9.** In the Edit name dialog box, click **OK**.

**10.** In the name Manager dialog box, click **Close**.

**11.** To verify that you selected the proper ranges for the Q1Expenses range, open the **Name** box drop-down list (to the left of the formula bar) and select **Q1Expenses**. The ranges B7:D7 and B16:D16 are selected.

**12.** Create named ranges for **Q2Expenses (E7:G7**, **E16:G16)**, **Q3Expenses (H7:J7**, **H16:J16)**, and **Q4Expenses (K7:M7**, **K16:M16)**.

**13.** Copy the formula from cell **B19** to **B20:B22**. Edit the formulas in cells **B20**, **B21**, and **B22** to use the appropriate named range. For example, the formula in cell B20 should be =SuBTOTAL(9,Q2Expenses).

**14.** SAVE the workbook to your Lesson 5 folder and CLOSE it.

**PAUSE. LEAVE Excel open to use in the next exercise.**

## Step-by-Step 14 – Review an Error Message

**GET READY. LAUN CH Excel if it is not already running.**

**1.** OPEN the ***05 Budget Error*** data file for this lesson.

**2.** Click in cell **S6**.

**3.** Edit the formula to change S3 to **R3** and press **Enter**. The first cell reference in the PMT formula now points to the wrong cell. A #VALUE! error displays in cell S6.

**4.** Click in cell **S6**. Click the small, yellow warning icon to the left of the cell. A pop-up menu appears. The first item tells you that there is a value error in the function.

**5.** In the menu, select **Help on this error**. Excel Help opens to a page on information regarding formula errors. Browse the help topics to see if any of the potential solutions apply to your situation.

**6.** Close the Excel Help window.

**7.** SAVE the workbook to your Lesson 5 folder as ***05 Budget Error Solution***.

**Pause. Leave the workbook open to use in the next exercise.**

## Step-by-Step 15 – Trace a Formula and Remove Trace Arrows

**GET READY. USE the workbook you modified in the previous exercise.**

**1.** Select cell **S6** if it’s not already selected.

**2.** On the FORMULAS tab, in the Formula Auditing group, click **Trace Precedents**. Two arrows appear (see Figure 5-29). One arrow extends from cell R3 to cell S6, and another (combined) arrow extends from cells S4 and S5 to S6. The arrows indicate that the formula in cell S6 refers to cells R3, S4, and S5, referred to as *precedent cells*.

**3.** On the FORMULAS tab, in the Formula Auditing group, click **Remove Arrows**. The trace arrows disappear from the worksheet.

**4.** Click cell **S4**. On the FORMULAS tab, in the Formula Auditing group, click **Trace Dependents**. One arrow appears from cell S4 to cell S6 (see Figure 5-30). The arrow indicates that cell S4 is part of the formula in cell S6.

5. SAVE the workbook and CLOSE it.

**Pause. Leave Excel open to use in the next exercise.**

## Step-by-Step 16 – Print Formulas

**GET READY. Launch Excel if it is not already running.**

**1.** OPEN ***05 Budget Print*** from your Lesson 5 folder.

**2.** On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas**. The formulas appear in the worksheet.

**3.** Click the **FILE** tab. Click **Print** and view the Print Preview.

**4.** Click the **Portrait Orientation** button and select **Landscape Orientation**.

**5.** At the bottom of the print settings, click the **Page Setup** link to open the Page Setup dialog box.

**6.** On the Page tab of the dialog box, click **Fit to:** and leave the defaults as **1 page(s) wide** by
**1 tall** (see Figure 5-32). Click **OK** to close the dialog box.

**7.** At the top-left corner of the Backstage view window, click the **Print** button to print the worksheet with formulas displayed.

*You learn more about print options in Lesson 7 , “Formatting Worksheets.”*

**8.** On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas** again to stop displaying formulas in the worksheet.

**9.** SAVE the workbook to your Lesson 5 folder as ***05 Budget Print Solution*** and CLOSE it.

CLOSE Excel.