This is the reason for using the AutoNumber data type, which automatically assigns a unique number to each row in the table as it is created.

Required refers to whether the column must have a data value. If it must, a value must be present in the column. If not, the column may be blank. Note that because CustomerID is a primary key used to identify each row it *must* have a value.

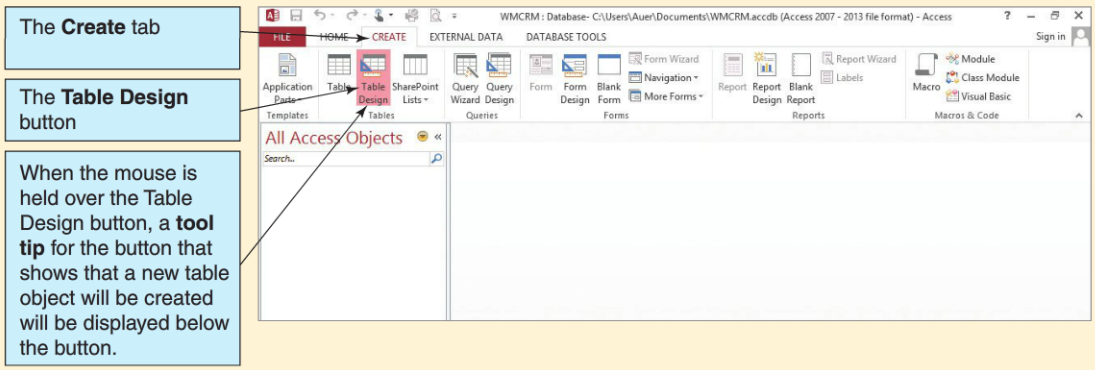
Remarks contains comments about the column or how it is used. For CUSTOMER, the only comment is that CustomerID is a **surrogate key**. Surrogate keys are discussed in Chapter 2. At this point, you simply need to know that surrogate keys are usually computer-generated unique numbers used to identify rows in a table (that is, a primary key). This is done by using the Microsoft Access AutoNumber data type.

Creating the CUSTOMER Table

1. Click the **Create** command tab to display the **Create** command groups.
2. Click the **Table Design** button, as shown in Figure AW-1-13.
3. The **Table1** tabbed document window is displayed in **Design** view, as shown in Figure AW-1-14. Note that along with the **Table1** window a contextual tab grouping named **Table Tools** is displayed and that this tab grouping adds a new command tab named **Design** to the set of command tabs displayed.
   - **NOTE:** It seems like now would be a good time to name the new table CUSTOMER. With Microsoft Access, however, you do not name a table until you save it the first time, and you cannot save a table until you have at least one column defined. So, we will define the columns, and then we will save and name the table. If you want, save the table after you have defined just one column. This will close the table, so you will have to reopen it to define the remaining columns.
4. In the **Field Name** column text box of the first line, type the column name **CustomerID** and then press the **Tab** key to move to the **Data Type** column. (You can also click the Data Type column to select it.)
   - **NOTE:** The terms *column* and *field* are considered synonyms in database work. The term *attribute* is also considered to be equivalent to these two words.
5. Select the **AutoNumber** data type for CustomerID from the **Data Type** drop-down list, as shown in Figure AW-1-15.
6. If you like, an optional comment may be stored in the Description column. To do so, move to the Description column by pressing the **Tab** key or clicking in the **Description** text box.

FIGURE AW-1-13

The Table Design Button



(Continued)

FIGURE AW-1-14

The Table1 Tabbed Document Window

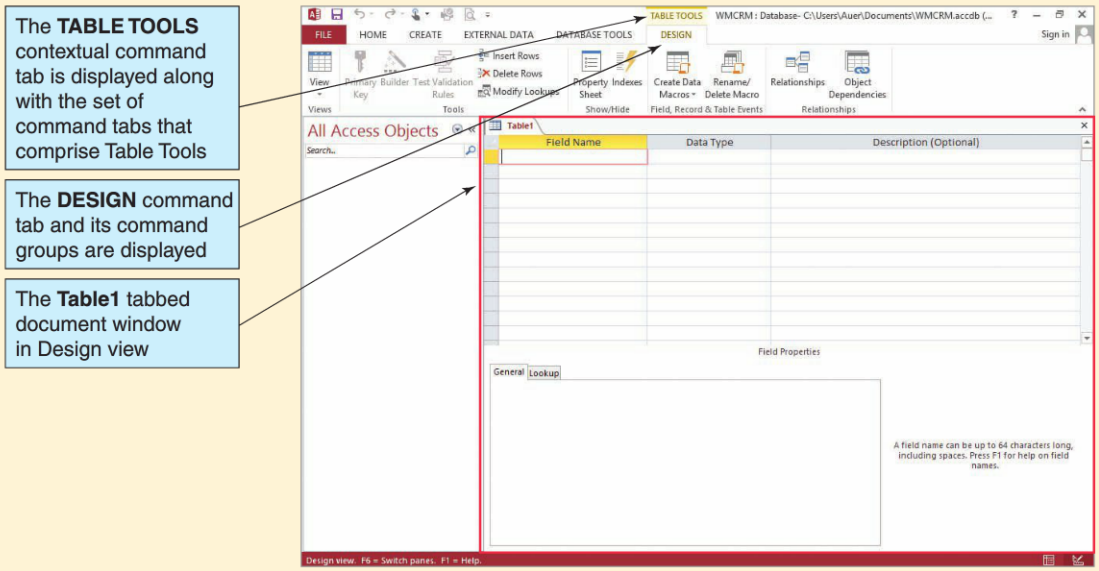


FIGURE AW-1-15

Selecting the Data Type

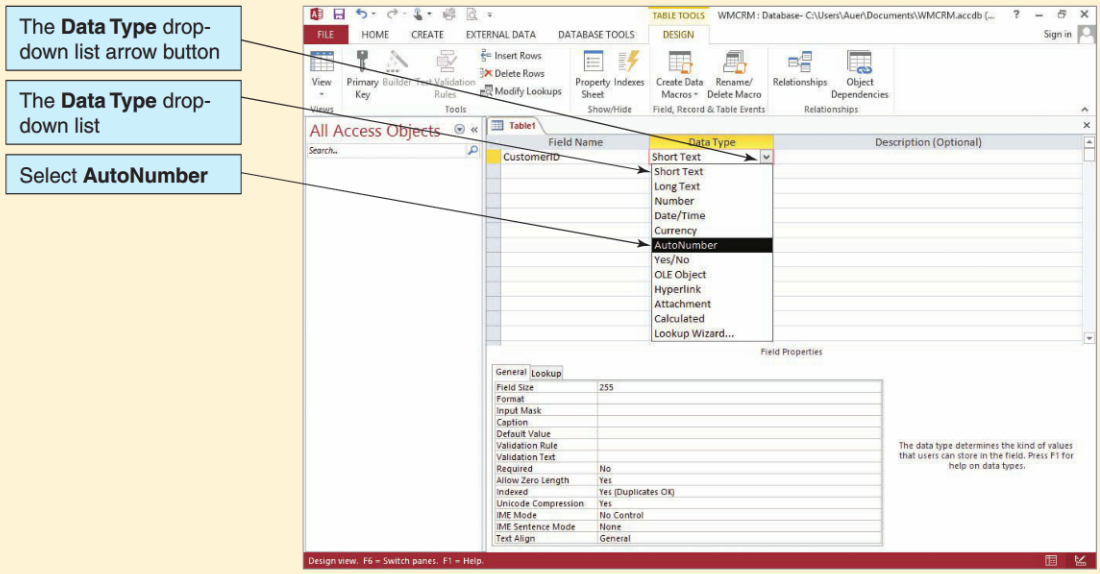
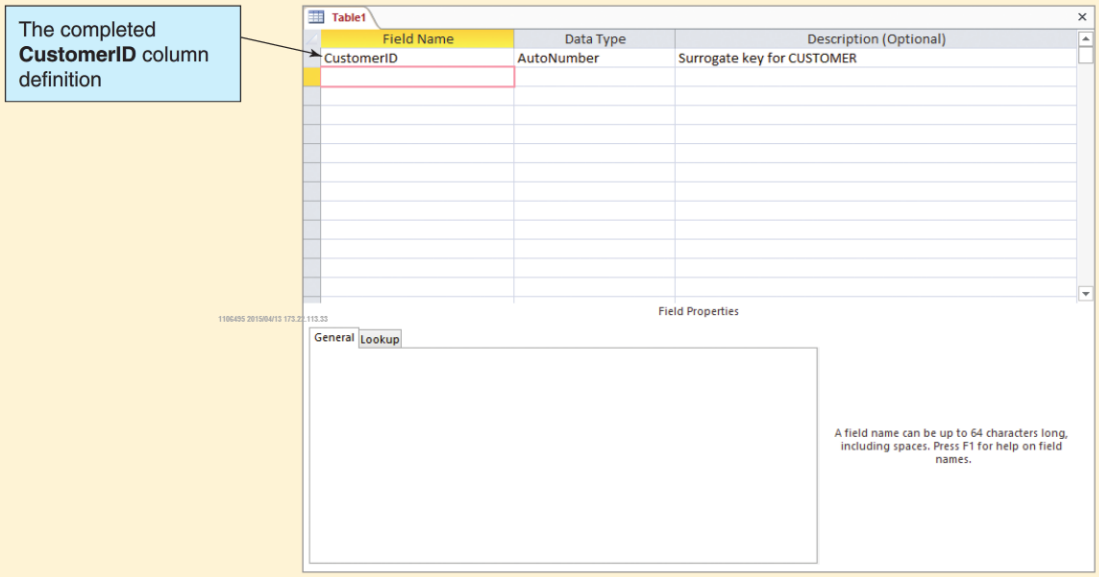


FIGURE AW-1-16

The Completed CustomerID Column



Type the text **Surrogate key for CUSTOMER** and then press the **Tab** key to move to the next row. The **Table1** tabbed document window now looks as shown in Figure AW-1-16.

- **NOTE:** The Remarks column in the set of database column characteristics shown in Figure AW-1-11 is *not* the same as the table Description column shown in Figure AW-1-16. Be careful not to confuse them. The Remarks column is used to record technical data, such as facts about table keys and data default values that are necessary for building the table structure. The Description column is used to describe to the user the data stored in that field so that the user understands the field's intended use.

7. The other columns of the CUSTOMER table are created using the sequence described in steps 4 through 6—at this point you should add each of the remaining columns shown in Figure AW-1-9 to the CUSTOMER table while following those steps.
   - **NOTE:** See Figure AW-1-19 for the Description entries.
8. To set the number of characters in text columns, edit the **Data Type Field Size** property text box, as shown in Figure AW-1-17. The default value for Field Size is 255, which is also the maximum value for a text field.
9. To make a column required, click anywhere in the column **Data Type Required** property text box to display the **Required** property drop-down list arrow button, then click the button to display the Required property drop-down list, as shown in Figure AW-1-18, and then select **Yes** from the Required property drop-down list. The default is No (not required), and Yes must be selected to make the column required.[6]

[6]Microsoft Access has an additional Data Type property named Allow Zero Length. This property confounds the settings necessary to truly match the SQL constraint NOT NULL discussed in Chapter 3. However, the discussion of Allow Zero Length is beyond the scope of this book. See the Microsoft Access Help system for more information.

(Continued)

FIGURE AW-1-17

Editing the Text Field Size

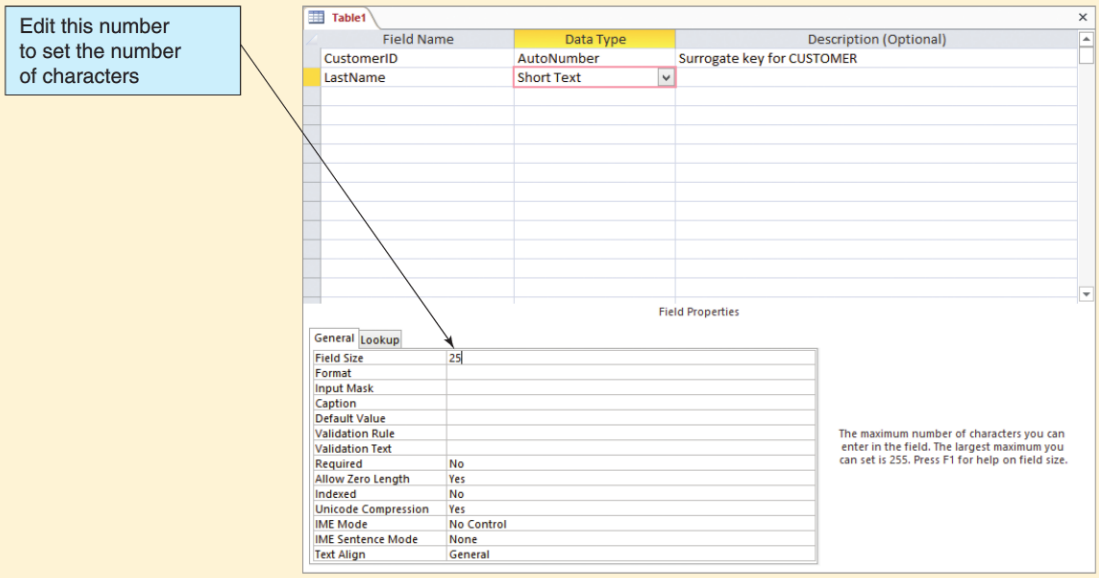
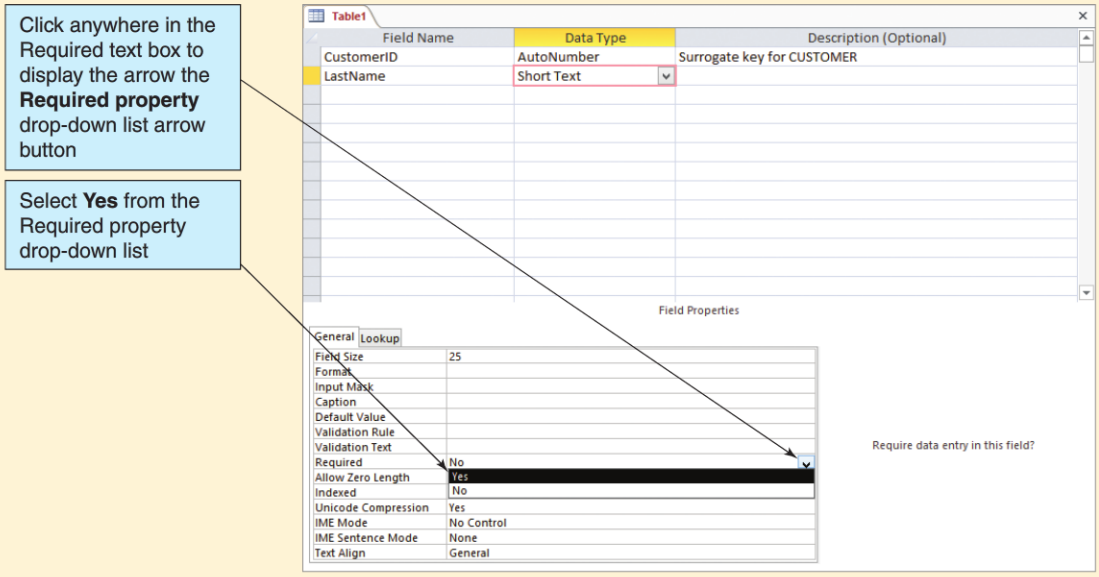


FIGURE AW-1-18

Setting the Column Required Property Value



Now we need to set a primary key for the CUSTOMER table. According to Figure AW-1-11, we need to use the CustomerID column as the primary key for this table.

Setting the CUSTOMER Table Primary Key

1. Move the mouse pointer to the **row selector column** of the row containing the CustomerID properties, as shown in Figure AW-1-19. Click to select the row.
2. Click the **Primary Key** button in the Tools group of the Design tab, as shown in Figure AW-1-20. CustomerID is selected as the primary key for the CUSTOMER table.

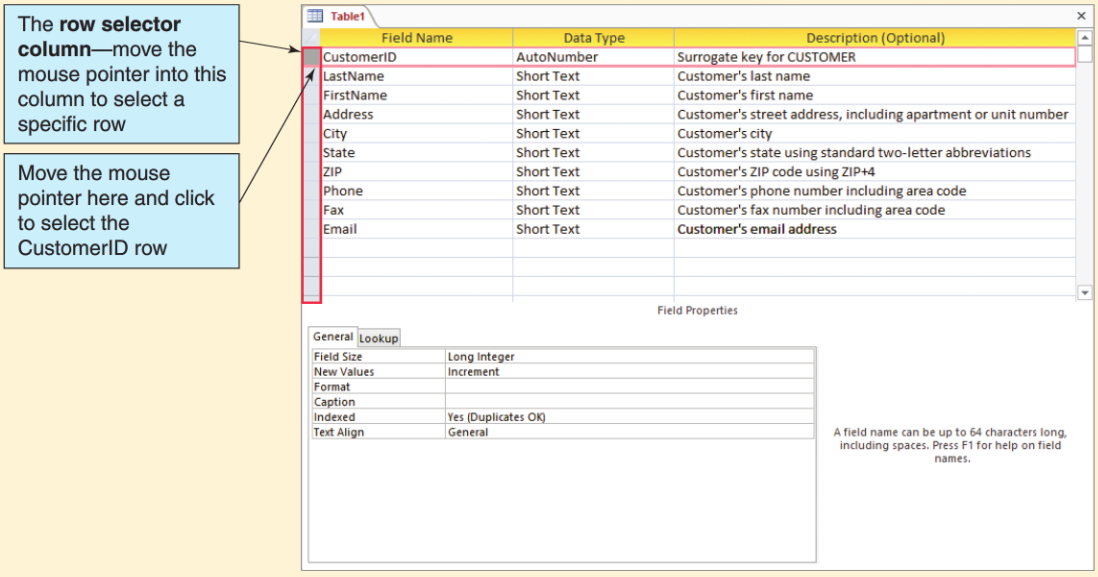
We have finished building the CUSTOMER table. Now we need to name, save, and close the table.

Naming, Saving, and Closing the CUSTOMER Table

1. To name and save the CUSTOMER table, click the **Save** button in the Quick Access Toolbar. The **Save As** dialog box appears, as shown in Figure AW-1-21.
2. Type the table name **CUSTOMER** into the **Save As** dialog box's Table Name text box and then click **OK**. The table is named and saved. The table name CUSTOMER now appears on the document tab, and the CUSTOMER table object is displayed in the Navigation Pane, as shown in Figure AW-1-22.
3. To close the CUSTOMER table, click the **Close** button in the upper-right corner of the tabbed documents window, as shown in Figure AW-1-22. After the table is closed, the CUSTOMER table object remains displayed in the Navigation Pane, as shown in Figure AW-1-23.

FIGURE AW-1-19

Selecting the CustomerID Row



(Continued)

FIGURE AW-1-20

Setting the Primary Key

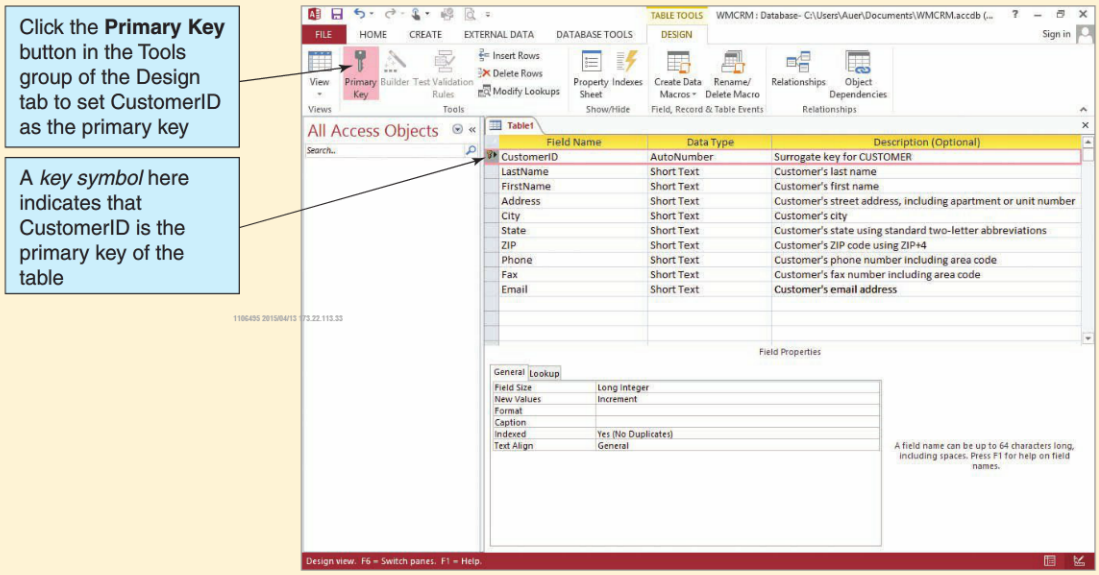
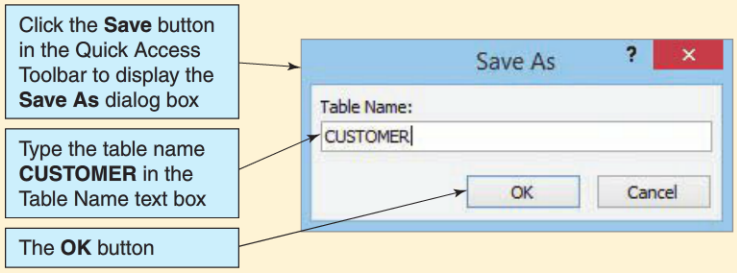


FIGURE AW-1-21

Naming and Saving the CUSTOMER table



Inserting Data into Tables: The Datasheet View

There are three commonly used methods for adding data to a table. First, we can use a table as a **datasheet**, which is visually similar to and works like a Microsoft Excel worksheet. When we do this, the table is in **Datasheet view**, and we enter the data cell by cell. Second, we can build a **data entry form** for the table and then use the form to add data. Third, we can use SQL to insert data. This section covers the first two of these methods; we will use the SQL method in Chapter 3's section of "The Access Workbench."

In Microsoft Access 2013, we can also use Datasheet view to create and modify table characteristics. When we open a table in Datasheet view, the Table Tools contextual tab includes a Datasheet command tab and ribbon with tools to do this. We do *not* recommend this; it is better to use Design view, as previously discussed in this section, for creating and modifying table structures.

FIGURE AW-1-22

The Named CUSTOMER Table

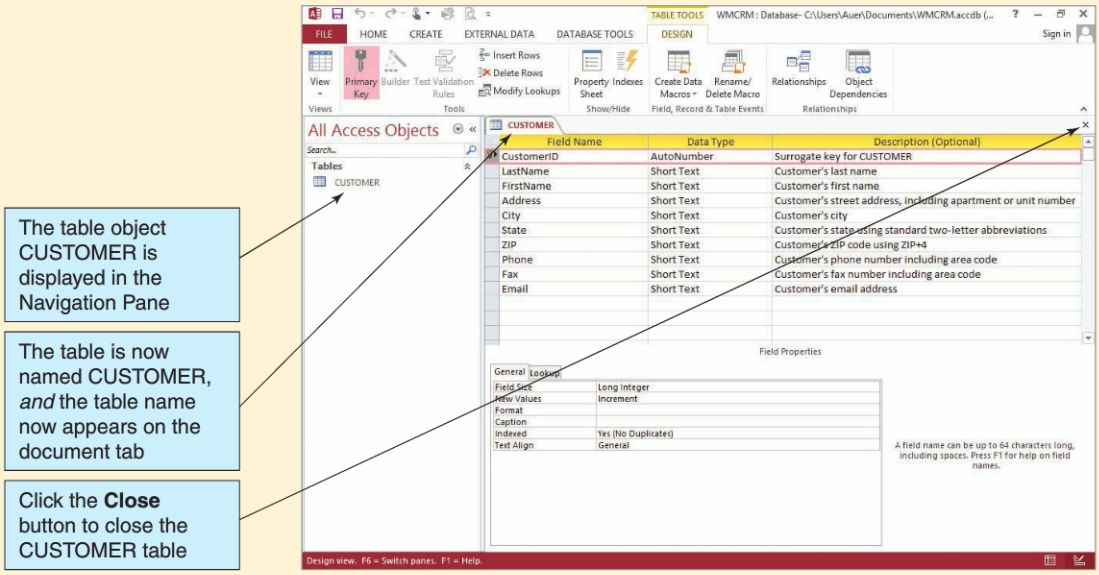
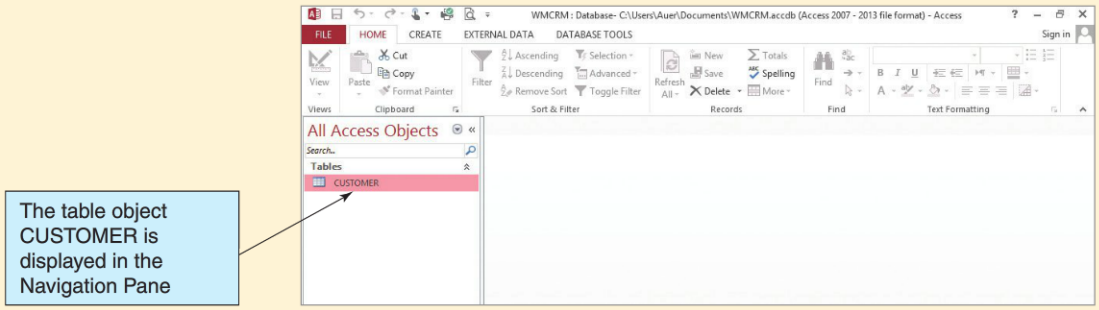


FIGURE AW-1-23

The CUSTOMER Table Object



However, at this point we do not need to modify the table structure—we simply need to put some data into the CUSTOMER table. Figure AW-1-24 shows some data for Wallingford Motors customers.

Adding Data to the CUSTOMER Table in Datasheet View

1. In the Navigation Pane, double-click the **CUSTOMER** table object. The CUSTOMER table window appears in a tabbed document window in Datasheet view, as shown in

(Continued)

FIGURE AW-1-24

CUSTOMER Data

LastName	FirstName	Address	City	State	Zip
Griffey	Ben	5678 25th NE	Seattle	WA	98178
Christman	Jessica	3456 36th SW	Seattle	WA	98189
Christman	Rob	4567 47th NW	Seattle	WA	98167
Hayes	Judy	234 Highland Place	Edmonds	WA	98210

LastName	FirstName	Phone	Fax	Email
Griffey	Ben	206-456-2345		Ben.Griffey@somewhere.com
Christman	Jessica	206-467-3456		Jessica.Christman@somewhere.com
Christman	Rob	206-478-4567	206-478-9998	Rob.Christman@somewhere.com
Hayes	Judy	425-354-8765		Judy.Hayes@somewhere.com

Figure AW-1-25. Note that some columns on the right side of the datasheet do not appear in the window, but you can access them by scrolling or minimizing the Navigation Pane.

- **NOTE:** As in a worksheet, the intersection of a row and column in a datasheet is called a *cell.*

2. Click the **Shutter Bar Open/Close** button to collapse the Navigation Pane. This makes more of the CUSTOMER datasheet visible, as shown in Figure AW-1-26.

FIGURE AW-1-25

The CUSTOMER Table in Datasheet View

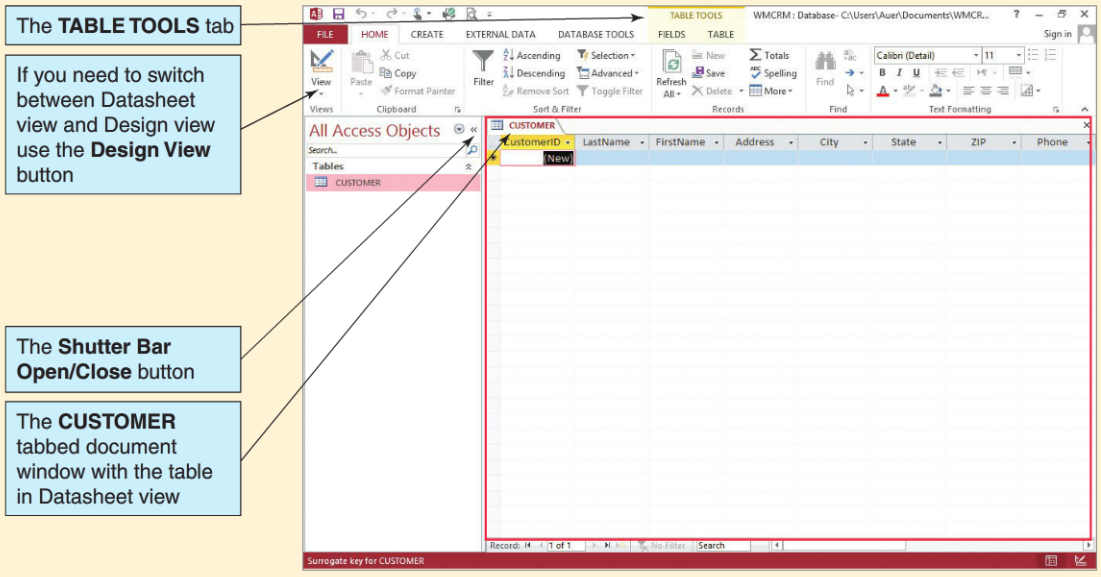
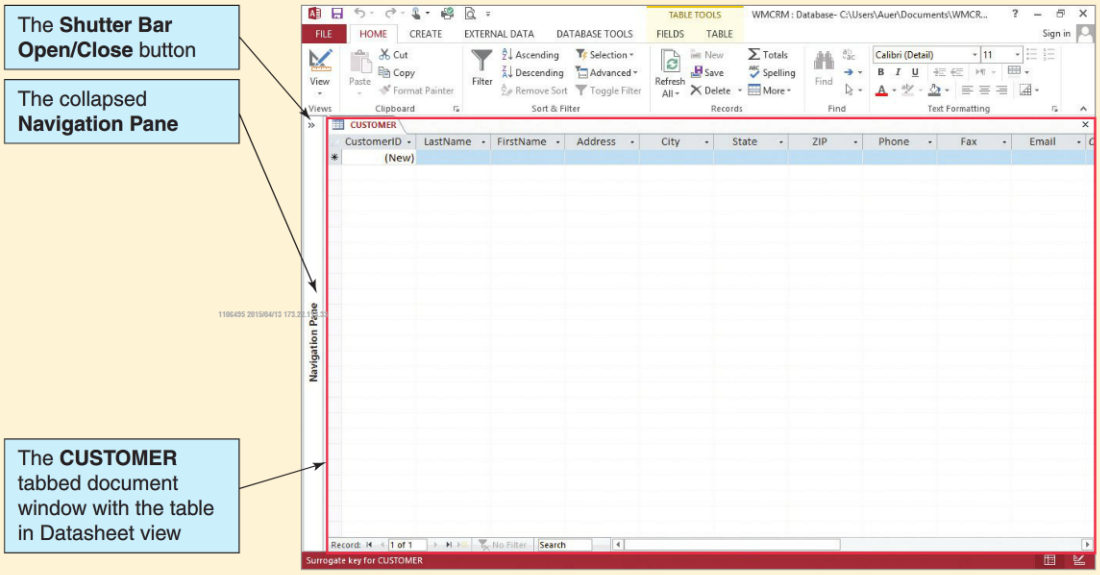


FIGURE AW-1-26

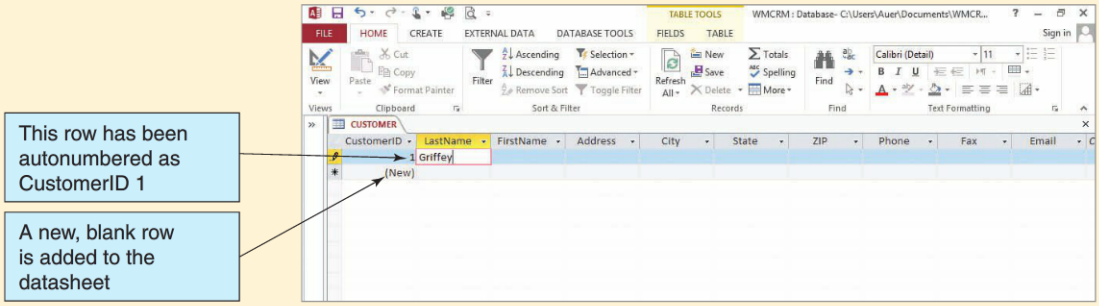
The Collapsed Navigation Pane



3. Click the **CUSTOMER** document tab to select the CUSTOMER table in Datasheet view.
4. Click the cell in the CustomerID column with the phrase **(New)** in it to select that cell in the new row of the CUSTOMER datasheet.
5. Press the **Tab** key to move to the LastName cell in the new row of the CUSTOMER datasheet. For customer Ben Griffey, type **Griffey** in the LastName cell. Note that as soon as you do this the AutoNumber function puts the number 1 in the CustomerID cell and a new row is added to the datasheet, as shown in Figure AW-1-27.

FIGURE AW-1-27

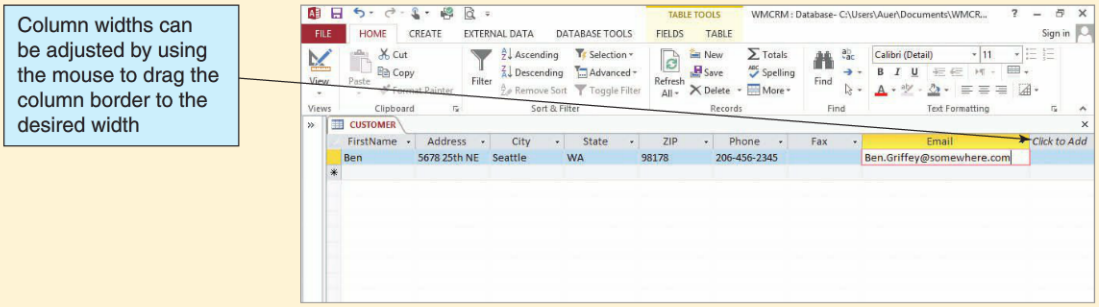
Entering Data Values for Ben Griffey



(Continued)

FIGURE AW-1-28

The Completed Row of Data Values



6. Using the **Tab** key to move from one column to another in the CUSTOMER datasheet, enter the rest of the data values for Ben Griffey.
7. The final result is shown in Figure AW-1-28. Note that the width of the Email column was expanded using the mouse to move the border of the column—just as you would in a Microsoft Excel worksheet.
   - **NOTE:** If you make a mistake and need to return to a cell, click the cell to select it and Microsoft Access will automatically shift into Edit mode. Alternatively, you can use **Shift-Tab** to move to the right in the datasheet and then press **F2** to edit the contents of the cell.
   - **NOTE:** Remember that LastName, FirstName, and Phone *require* a data value. You will not be able to move to another row or close the table window until you have a value in each of these cells.
   - **NOTE:** Figure AW-1-28 shows a column labeled *Click to Add* to the right of the Email column. This is a table tool in Datasheet view that you can use to create or modify table structures. We do not recommend using these tools—we prefer to use Design view instead!
8. Use the **Tab** key to move to the next row of the CUSTOMER datasheet and enter the data for Jessica Christman, as shown in Figure AW-1-29.

FIGURE AW-1-29

The Completed CUSTOMER Datasheet