CHAPTER A

Creating and Using Databases with Microsoft Access

IN THIS CHAPTER, YOU WILL

Use Access to explore a simple database

Design and create a new database

Create and use forms

Create and use queries

Create and use reports

In this extra chapter, you learn about databases and the way databases work. You learn to use Microsoft Access to create a new database and to create the forms, queries, and reports used to manage the data in the database.

As always, try to do each On Your Own activity without any help. But remember, if you need help, you can always refer to the solutions, which you can find in the Chapter A Solutions document in the Extra Chapters folder on the DVD.

JUMP RIGHT IN

If you want even more of a challenge, try proceeding directly to the Chapter Mastery Project at the end of this chapter. If you need help on the project, refer to the On Your Own activities in the chapter or do your own independent investigating using Access Help or searching the web for answers. When you complete the project, you will have mastered the skills in this chapter.

How Will This Chapter Help Me?

Throughout this book, each chapter provides three projects focusing on personal, academic, or technical career goals. Depending on your own interests, you might choose to perform any or all of these projects to help you achieve your goals.

PERSONAL PROJECT: I've kept records for a small business using Excel, and I want to convert this data to an Access database. How do I design and set up the database using my worksheets to guide me?

ACADEMIC PROJECT: I need to understand how Excel and Access are the same and how they are different. When is it best to use Excel, and when do I use Access? Access seems to be more complicated, but maybe my work needs a more complicated solution.

TECHNICAL CAREER PROJECT: A client has stored a lot of data in Word tables and now she wants to move that data into an Access database. She has asked me to help her figure it out. How do I begin?

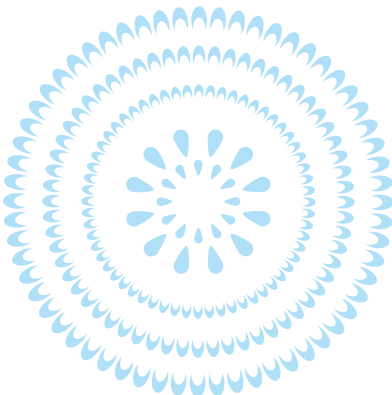# Using Access to Explore a Simple Database

Microsoft Access is an application that stores and maintains data in a database. Access is an example of a **database management system (DBMS)** used to manage a small database on a personal computer.

> **Microsoft Access**—One of the applications included in Microsoft Office and used to manage a database. Use it to create and edit database tables and to build forms and reports that use the tables.
>
> **Database management system (DBMS)**—Software that stores and updates data in a database. A small-scale DBMS manages a database on a personal computer, and a large-scale DBMS manages a database on a mainframe computer with many personal computers updating that data. Access is an example of a small-scale DBMS. SQL Server by Microsoft and Oracle by Oracle Corporation are examples of a large-scale DBMS.

A database keeps data in one or more tables. A table is made up of records (rows) and fields (columns). Each field has a field name (column heading). Figure A-1 shows the Access window displaying the AnimalShelter database that has one table. A database with only one table is sometimes called a flat-file database.

> **Tip** Notice in Figure A-1 the title bar shows Access 2007. Access 2010 uses the .accdb file extension and format for a database that was first introduced with Access 2007. The title bar reminds us of this fact.
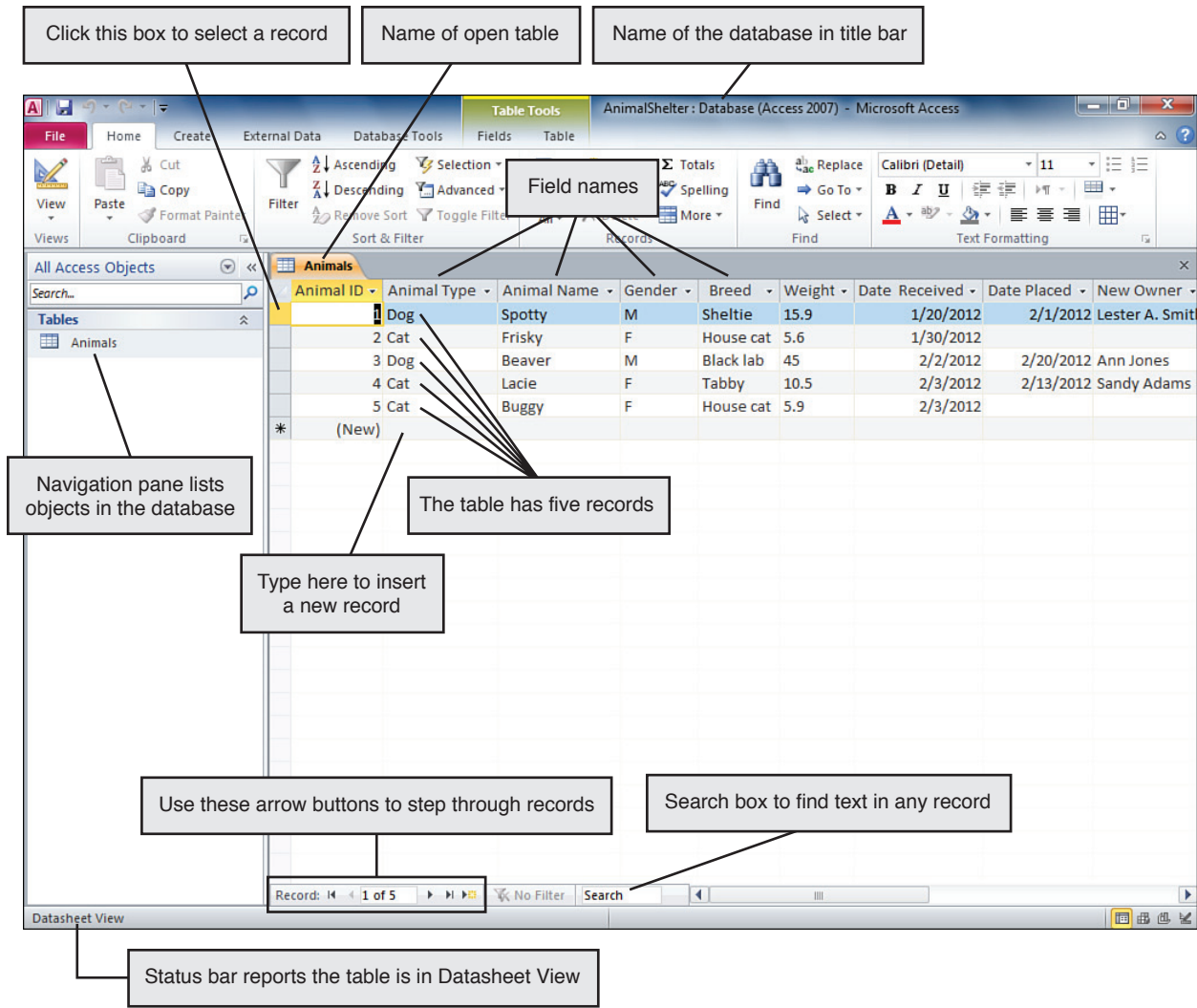
Click this box to select a record   Name of open table   Name of the database in title bar

Field names

Navigation pane lists objects in the database

The table has five records

Type here to insert a new record

Use these arrow buttons to step through records

Search box to find text in any record

Status bar reports the table is in Datasheet View

FIGURE A-1
A table in a database is made up of records (rows) and fields (columns).

The AnimalShelter database is located in the Extra Chapters folder on the DVD. Do the following to view and edit the data in Access:

Step 1. Using Windows Explorer, copy the AnimalShelter database file from the Extra Chapters folder on the DVD to your USB flash drive, hard drive, or another location given by your instructor.

Step 2. Using Microsoft Access, open the AnimalShelter database. The AnimalShelter database name appears in the title bar of the Access window.

Database tables are listed in the left pane of the Access window, which is called the Navigation pane. When you first open a database, the tables are closed.

Do the following to open and explore the Animals table:

Step 1. To open the table, double-click the **Animals** table name in the left pane. The table appears in the right pane in the **Datasheet view**. The current view of a table is displayed in the status bar at the bottom of the Access window.

On Your Own A-1
Explore the AnimalShelter Database and the Access Window

Datasheet view—A view in Access that shows the data in the database.

On Your Own A-1
Explore the AnimalShelter Database and the Access Window

? Solutions Appendix

For help, see Solution A-1: How to Explore the AnimalShelter Database and the Access Window.

Step 2. Identify on your own computer the items labeled in Figure A-1.

Step 3. Add a new record to the table making up your own data. Notice a counting number is automatically added to the Animal ID field. What happens when you try to enter a value into this field?

Hint To add a new record, go to the bottom of the table and type the data in the blank record, which is indicated by an asterisk (*).

Step 4. Try to enter a letter other than M or F into the Gender field and describe what happens. Try to enter data other than a date into the Date Received or Date Placed field and describe what happens.

Step 5. Close the Animal table. You don't need to save your changes to the data because Access automatically does that for you.

Hint The solutions for the activities in this chapter are in the Extra Chapters folder on the DVD in the Chapter A Solutions file.

Each field in a table is assigned a **data type**. You can see the data type for each field when you view the table in **Design view**.

> **data type**—A property of a field that determines what kind of data the field can store, for example, text, date, or currency. Also called field type.
>
> **Design view**—A view in Access that allows you to change the design of a table, for example, to add a new field to a table.

On Your Own A-2
Use the Design View of the Animals Table
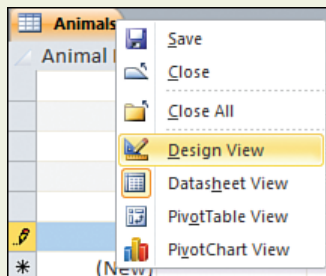
Do the following to view the table in Design view:

Step 1. Using the AnimalShelter database, open the **Animals** table. To go to Design view, right-click the **Animals** tab and select **Design View** from the shortcut menu. The Design view displays as shown in Figure A-2.

Step 2. The Data Type column shows the type for each field. Click in a Data Type box and then click the drop-down arrow to the right of the data type to see a list of types. In this chapter, we use only the AutoNumber, Text, Date/Time, Number, and Currency types.

Step 3. Notice in Figure A-2 the following about the design of this table:

▸ The Animal ID field uses the AutoNumber data type. This data type automatically inserts a sequential counting number in the field for each new record.

▸ The Weight field uses the Text data type. Unless a field is used for calculations, use the Text data type even if the field contains only numeric values.

▶ The Date Received and Date Placed fields use the Date/Time data type, which allows only dates into these fields.

▶ Each table has a **primary key**. The key icon beside Animal ID identifies this field as the primary key.

primary key—One or more fields in a table that uniquely identify each record in the table. Access does not allow you to enter duplicate primary key values in a table.

Data type determines the type of data allowed in a field

The Animal ID field is the primary key for the table

List of fields in the table

Click to see other data types and change the type

Field Properties pane is used to control data input for the selected field

FIGURE A-2
The Design view shows information about the table design.

On Your Own A-2
**Use the Design View of the Animals Table**

Tip In Excel, you can enter duplicate rows in a table, but Access does not allow duplicate records in a table because no two records can have the same primary key.

You can have Access protect the integrity of data by setting up a validation rule for a field. Do the following to find out how:

Step 1. Click on the **Gender** field. The Field Properties pane displays the properties for this field (see Figure A-3). Note the following:

▶ The Field Size is set to 1, which prevents a user entering more than one character into the field.

▶ The Validation Rule is set to "M" Or "F", which limits data input to one of these characters.

▶ The Validation Text will display whenever a user enters data that does not fit the Validation Rule.

Gender field is selected
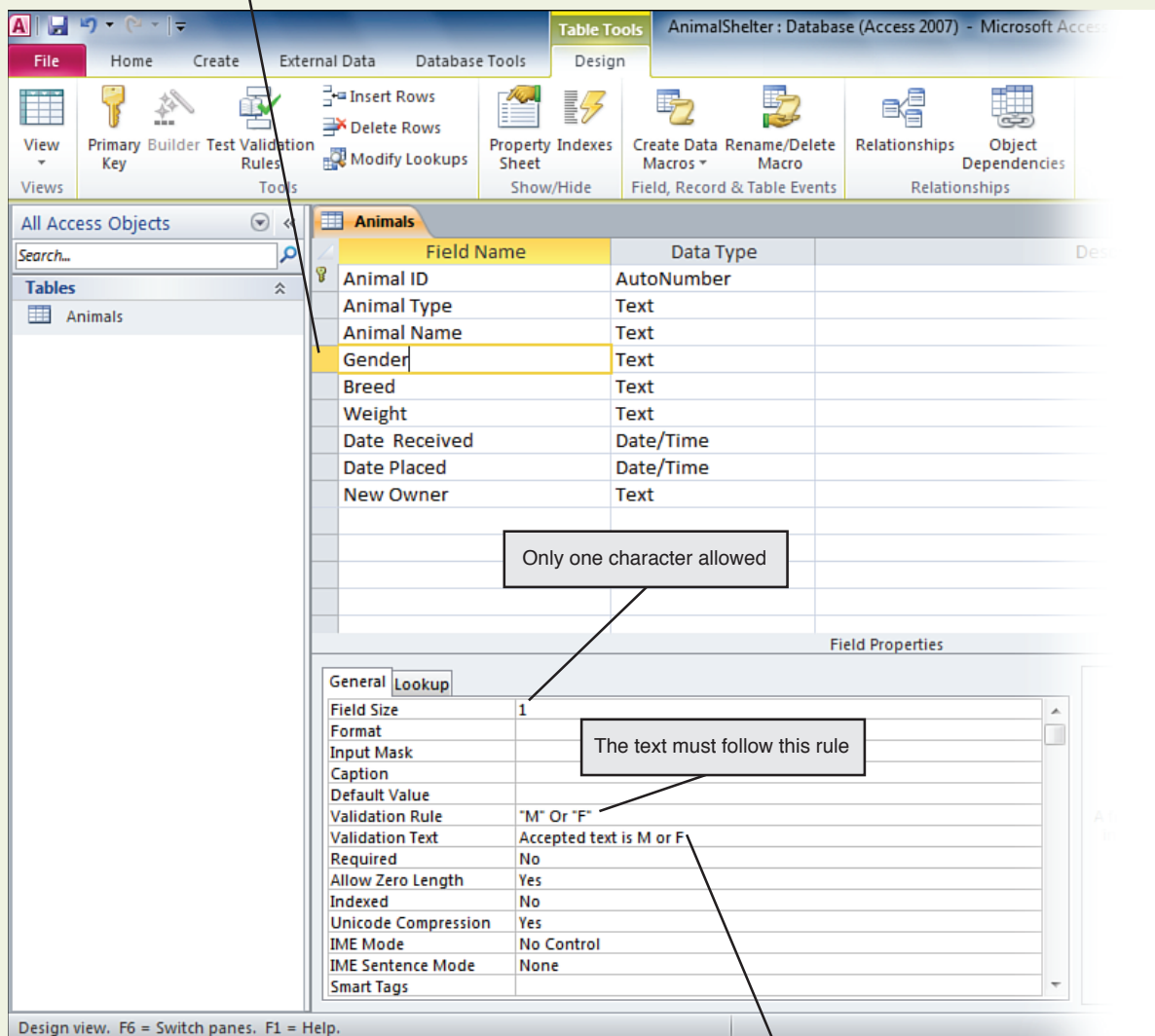
Only one character allowed

Field Properties

The text must follow this rule

This text is the error message that appears when the validation rule is broken

FIGURE A-3
Use the field properties to protect the integrity of data in the field.

Step 2. Change the Validation Text to say **Only M or F is allowed.**

Step 3. To save your changes to the table design, right-click the **Animals** tab and select **Save** from the shortcut menu.

> **Hint** Access automatically saves changes made to the data in a database table, but you must tell Access to save changes you make to the table design.

Step 4. Return to the **Datasheet view**. Enter a new record or edit an existing record. What displays when you enter a character other than M or F in the Gender field?

You can sort and filter data using the Sort & Filter group on the Home ribbon. You can also sort and filter a table just as you learned to do with Excel in Chapter 11, "Organizing Data Using Excel." Do the following to find out how:

Step 1. In Datasheet view, click the drop-down arrow to the right of the Gender field name. Sort the data by Gender.

Step 2. Sort the data by Animal ID.

**Step 3.** Filter the data so that only cats are displayed. What field did you use for the filter?

Step 4. Remove the filter so that all records appear. Delete one record in the table.

Step 5. Save your changes to the Animals table.

> **Hint** To delete a record, click the selection box to the left of the record to select it. Then click **Delete** on the Home ribbon. You can also delete a record by right-clicking the selection box and selecting **Delete Record** from the shortcut menu.
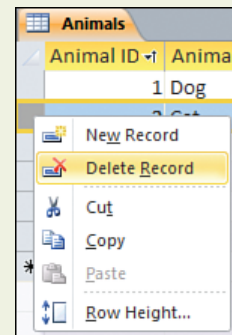
For help, see Solution A-2: How to Use the Design View of the Animals Table.

Solutions Appendix

A **query** allows you to select what part of the data you want to see onscreen. Create a query when you find you need to occasionally view only part of the data. When you run a query, only the data that satisfies the criteria for the query appears onscreen. You can edit the data in the query, and these edits are applied to the underlying tables that hold the data.

> **query**—A view of the data that has selected fields and records and can include calculations. You can view and edit the data in a query.

On Your Own A-3
Create and Run a Query

Using the AnimalShelter database, create a query to display only those animals that have been placed with new owners. The query results are shown in Figure A-4.

Animals table is still open

Name of the open query

The query includes four fields

The Placements query is listed as a database object

Records selected for the query have entries in the Date Placed field

FIGURE A-4
A query shows selected fields and lists only records that match the given criteria.

The Design view of the finished query is shown in Figure A-5. Do the following to create and run the query:

Step 1. Click **Query Design** on the Create ribbon. The Design view for a query appears along with the Show Table dialog box. Select the **Animals** table and click **Add**. The field list for the Animals table appears in the design window. Close the dialog box.

Step 2. Add **Animal ID**, **Animal Name**, **Date Placed**, and **New Owner** to the query. To add a field to the query, double-click the field.

Step 3. In the lower pane of the query design, sort the records by Animal Name in **Ascending** order.

Step 4. Set the criteria for the query so that Date Placed is greater than zero.

> **Hint** The criteria for a query select certain records to appear in the query results. The criteria are applied to a field and can use the =, >, and < operators. The criterion for the Date Placed field is **>0**.

Step 5. Save the query and name it **Placements**. The Design view of the finished query is shown in Figure A-5.

Step 6. To run the query, click **Run** on the Design ribbon, or you can return the query to Datasheet view.

Step 7. Notice the Placements query is now listed in the left pane of the Access window.

FIGURE A-5

The query design shows selected fields, sort order, and criteria used to select the records for the query.

Do the following to practice opening and closing a query, table, database, and the Access application:

Step 1. Close the Placements query, saving your changes.

Step 2. Close the Animals table, saving your changes.

Step 3. Open the Animals table and the Placements query.

Step 4. Close the database, saving any changes. Close the Access window.

Step 5. Open the AnimalShelter database in the Access window. Close the AnimalShelter database. Notice that Access still remains open, but no database is in view.

Now that you have explored a database and created a query, let's see how to create a new database.

Designing and Creating a New Database

When creating a database from scratch, follow these steps:

Step 1. Begin by deciding what you want the database to do for you. Decide what output or information you need the database to provide. Consider what queries and reports you need and what information goes on each.

Step 2. Decide what data you must keep to produce these queries and reports. (Recall from Chapter 11 that an Access report presents the data in a way appropriate for printing.) Make a list of all data items.

Step 3. Group these items into one or more tables. Identify the primary key for each table and how the tables will relate to each other.

Step 4. Use Access to implement your design, which includes tables, relationships between tables, forms, queries, and reports. (Recall from Chapter 11 that an Access form is used to edit the data.)

The first three steps produce a design for your database, and in step 4 you use Access to implement your design. When implementing the design in Access, you begin by creating each table and the relationships between tables. Let's follow these steps to create a database to track the entries in classes for a dog show.

Design the Database

To design the database, you need to first decide on the output. This database requires one query and two reports for the dog show:

▶ A query displayed onscreen that shows total entry fees received for all classes.

▶ A report listing the dogs and their owners in each class. This report goes to the ring master for each class in the show. The report is shown in Figure A-6. Notice the show has three classes: Agility, Showmanship, and Working.

▶ Mailing labels for all dog owners. These labels will be used to mail advertisements about future shows. Mailing labels ready to print are shown in Figure A-7.

FIGURE A-6
Begin your database design by deciding what reports you need from the database.

FIGURE A-7
Mailing labels are used to send advertisements about future shows.

Use the query and reports to come up with a list of data items the database must track. Figure A-8 shows a table containing the list of data items and sample data. Notice some of the data is repeated because a dog can enter more than one class. Each time a dog is entered into a class, the dog name and owner name and address are repeated. You can avoid repetition of data, called **data redundancy**, by using more than one table for the data.

data redundancy— Entering the same data more than once. Use enough tables in your database so as to avoid redundancy.

Dogs Entered into Classes

Class	Dog ID	Entry Fee	Dog Name	First Name	Last Name	Street	City	State	Zip
Agility	D007	15.00	Sir Edward	Louie	Jackson	400 Maryville Hwy	Knoxburg	OH	50000
Showmanship	D007	12.00	Sir Edward	Louie	Jackson	400 Maryville Hwy	Knoxburg	OH	50000
Working	D007	15.00	Sir Edward	Louie	Jackson	400 Maryville Hwy	Knoxburg	OH	50000
Showmanship	D05	12.00	Daisy	Sandy	Adams	100 Apple Lane	Smithville	OH	33000
Working	D05	15.00	Daisy	Sandy	Adams	100 Apple Lane	Smithville	OH	33000
Working	D10	15.00	Prissy	Betty	Clear	300 Mary Street	Smalltown	OH	33333
Showmanship	D4	12.00	Tildie	Bethany	Miller	1216 Bobwhite Dr	Stanton	OH	55555
Showmanship	D70	12.00	Prissy	Lorraine	Quency	344 Lee Street	Woodson	OH	22222
Agility	D90	15.00	Bonita	Latoya	Jones	378 Maple Street	Lakeville	OH	44444
Showmanship	D90	12.00	Bonita	Latoya	Jones	378 Maple Street	Lakeville	OH	44444

FIGURE A-8
When all the data is contained in a single table, some data is repeated.

The next step is to group the data into tables. The idea is to use as many tables as necessary to avoid redundancy. The process is called **normalizing** the database. In Figure A-8, you can see that the dog name and owner name and address are repeated multiple times in the table. This data redundancy can be eliminated by breaking the data into two tables, as shown in Figure A-9.

> **normalizing**—The process of grouping data into more than one database table so that data redundancy is avoided.

Dogs

Dog ID	Dog Name	First Name	Last Name	Street	City	State	Zip
D05	Daisy	Sandy	Adams	100 Apple Lane	Smithville	OH	33000
D007	Sir Edward	Louie	Jackson	400 Maryville Hwy	Knoxburg	OH	50000
D10	Prissy	Betty	Clear	300 Mary Street	Smalltown	OH	33333
D4	Tildie	Bethany	Miller	1216 Bobwhite Dr	Stanton	OH	55555
D90	Bonita	Latoya	Jones	378 Maple Street	Lakeville	OH	44444
D70	Prissy	Lorraine	Quency	344 Lee Street	Woodson	OH	22222

Entries

Class	Dog ID	Entry Fee
Agility	D007	15
Agility	D90	15
Showmanship	D007	12
Showmanship	D05	12
Showmanship	D4	12
Showmanship	D70	12
Showmanship	D90	12
Working	D007	15
Working	D05	15
Working	D10	15

FIGURE A-9
When the data is contained in two tables, data redundancy is avoided.

Information about a dog is kept in the Dogs table, and the Dog ID identifies each dog. The Entries table contains one line of data for each time a dog is entered into a class. The Dog ID identifies the dog in the Entries table. By using two tables, you don't need to type the dog name or owner name and address each time a dog is entered into a class.

Next, we identify the primary key for each table. Recall that the primary key is one or more fields in a table that uniquely identify a record. Here are the primary keys for each table:

▶ The primary key for the Dogs table is Dog ID. Each record in the table represents one dog. Two dogs might have the same name, but they do not have the same Dog ID.

▶ The primary key for the Entries table is Dog ID and Class. The Dog ID might be listed multiple times if the dog enters more than one class. A Class is listed multiple times, once for each entry. However, the combination of Dog ID and Class is never repeated because a dog cannot enter the same class more than one time.

Use Access to Implement the Database Design

Now that you have a database design, it is time to use Access to create the database. Create each database table and enter sample data into the table. The sample data can help you visualize how queries, forms, and reports will look.

When this activity is completed, the DogShow database should look like that in Figure A-10 with the Datasheet view of the Dogs table showing.

On Your Own A-4
Create a Database

Two tables are open

Database has two tables

Datasheet view of the Dogs table with sample data

FIGURE A-10
The DogShow database contains the Dogs table and Entries table.

Do the following to create the database:

Step 1. Open Access. On the Backstage view, click **New** and create a blank database. Name the database **DogShow** and save it to your USB flash drive, hard drive, or another location given by your instructor. What file extension does Access assign to the database file?

On Your Own A-4
Create a Database

Step 2. When you create a new database, Access automatically creates one table named Table1 that has one field named ID. Rename the table as the **Dogs** table and rename the ID field as the **Dog ID** field. Set the Data Type to Text.

Step 3. Add seven more fields to the Dogs table. Allow only two characters in the State field and five characters in the Zip field. Here is the list of fields:

    a. Dog ID, data type Text

    b. Dog Name, data type Text

    c. First Name, data type Text

    d. Last Name, data type Text

    e. Street, data type Text

    f. City, data type Text

    g. State, data type Text, two characters only

    h. Zip, data type Text, five characters only

Step 4. By default, the first field listed in a table is identified as the primary key. Verify the Dog ID field is the primary key for the Dogs table.

Step 5. Create the Entries table, which contains these fields:

    a. Class, data type Text

    b. Dog ID, data type Text

    c. Entry Fee, data type Currency

> **Hint** To create a new table in a database, click **Table** on the Create ribbon.

Step 6. Make the Dog ID and Class fields the primary key for the Entries table.

Step 7. Enter sample data shown in Figure A-9 into the Dogs table and Entries table or make up your own sample data for each table. Be sure that a Dog ID listed in the Entries table has a match in the Dogs table. Figure A-11 shows data in the Entries table.

Step 8. Access protects the integrity of data by not allowing duplicate values for the primary key into a table. Try to enter two records in the Dogs table that have the same Dog ID and describe what happens.

Step 9. Try to enter two records in the Entries table that have the same Dog ID and Class and describe what happens.

Step 10. Close both tables and save the database.

On Your Own A-4
Create a Database

FIGURE A-11
The Entries table is shown in Datasheet view.

For help, see Solution A-4: How to Create a Database.

Solutions Appendix

Create the Relationship Between Tables

An important feature of Access is the ability to connect or relate tables in a database. A relationship between tables is created by a field they have in common. After you create the relationship, you can display related data from both tables in a seamless query or report. A database that has tables related in this way is called a **relational database**.

> **relational database**—A database that links two or more tables together using fields they have in common.

The most common type of relationship between tables is a **one-to-many relationship**. When tables use this type of relationship, a **field value** occurs one time in the first table and multiple times in the second table. For the DogShow database, a value for the Dog ID occurs one time in the Dogs table and multiple times in the Entries table.

> **one-to-many relationship**—A relationship between database tables where a field value occurs one time in the first table and multiple times in the second table.
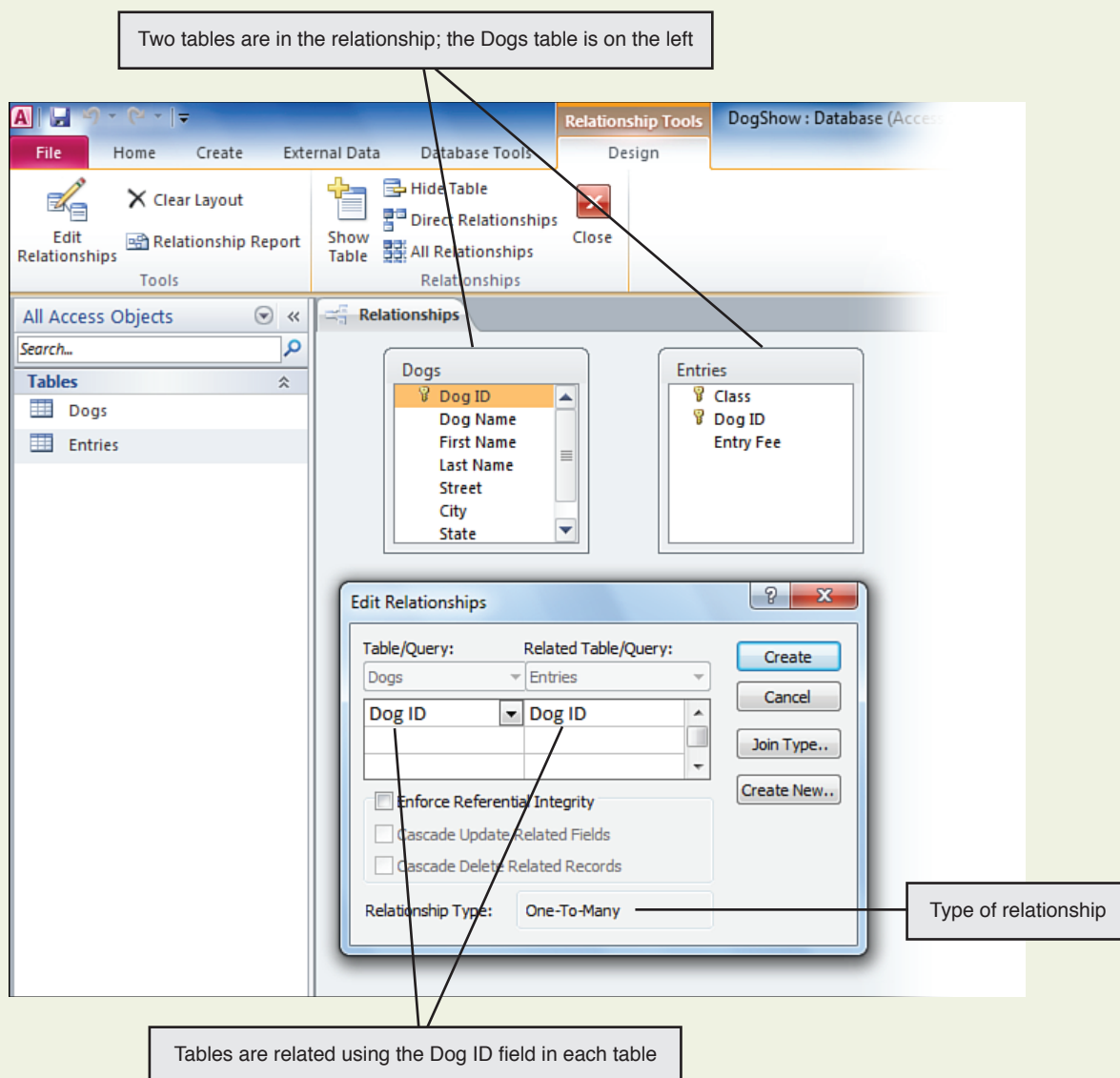> **field value**—The value (text, number, or date) in a field.

Relate Two Database Tables

Using the DogShow database, create a relationship between the Dogs table and Entries table using the Dog ID field they have in common:

Step 1. If necessary, open the **DogShow** database. Make sure the Dogs table and Entries table are closed. A table is closed when you don't see the table tab in the right pane of the Access window.

Step 2. On the Database Tools ribbon, click **Relationships**. The Relationships tab opens, and the Show Table dialog box appears.

Not Working? If the Show Table box does not appear, click **Show Table** on the Design ribbon.

Step 3. Select the **Dogs** table and click **Add**. Select the **Entries** table and click **Add**. Both tables are added to the relationship. Click **Close** to close the Show Table box.

Step 4. To create the relationship, press and drag the **Dog ID** field in the Dogs table to the **Dog ID** field in the Entries table. Be sure you drag from the Dogs table to the Entries table, not the other direction. When you press and drag the Dog ID field from one table to the next, the Edit Relationships box appears (see Figure A-12).

Two tables are in the relationship; the Dogs table is on the left

Type of relationship

Tables are related using the Dog ID field in each table

FIGURE A-12
Build a one-to-many relationship between the Dogs table and Entries table using the Dog ID field.

Step 5. Verify the field selected in both tables is Dog ID. Notice that Access recognizes the relationship as a one-to-many relationship.

Not Working? If Dog ID is not listed for both tables in the Edit Relationships box, click the field listed and select **Dog ID** from the drop-down list.

Step 6. Check **Enforce Referential Integrity** and click **Create**. When you enforce referential integrity, a value for Dog ID is allowed in the Entries table only if there is a matching value in the Dogs table.

Not Working? When you choose Enforce Referential Integrity, Access verifies the Entries table conforms to this enforcement. If it finds a Dog ID in the Entries table that does not have a match in the Dogs table, an error occurs and you cannot complete the relationship. Go back to the Entries table and correct the data. Then try to build the relationship again.

Step 7. Figure A-13 shows the relationship created. Notice the 1 and the infinity symbol (∞) on the relationship line that indicate the one-to-many relationship. To save the relationship, right-click the **Relationship** tab and select **Save** from the shortcut menu. To close the Relationship, right-click the **Relationship** tab and select **Close** from the shortcut menu.
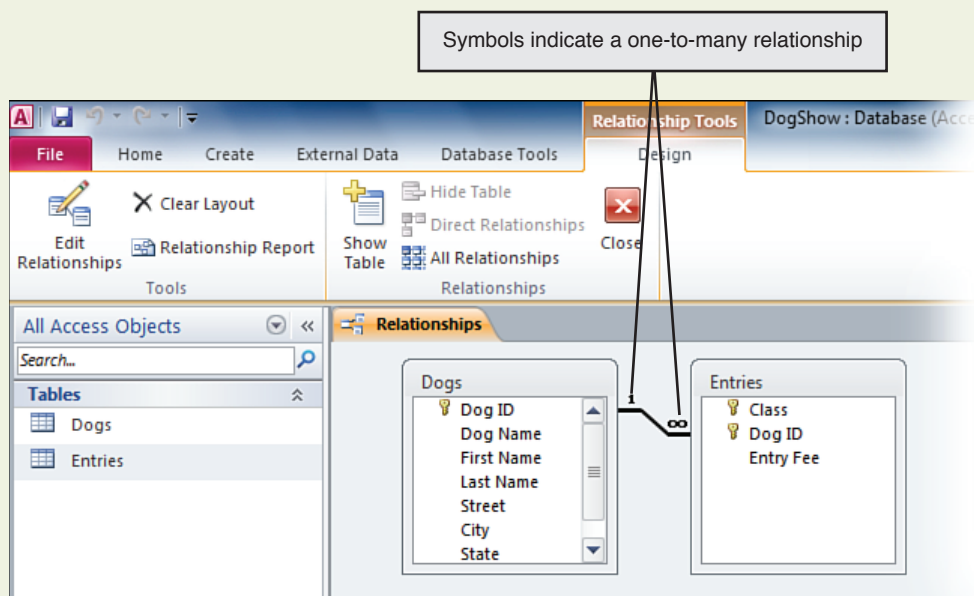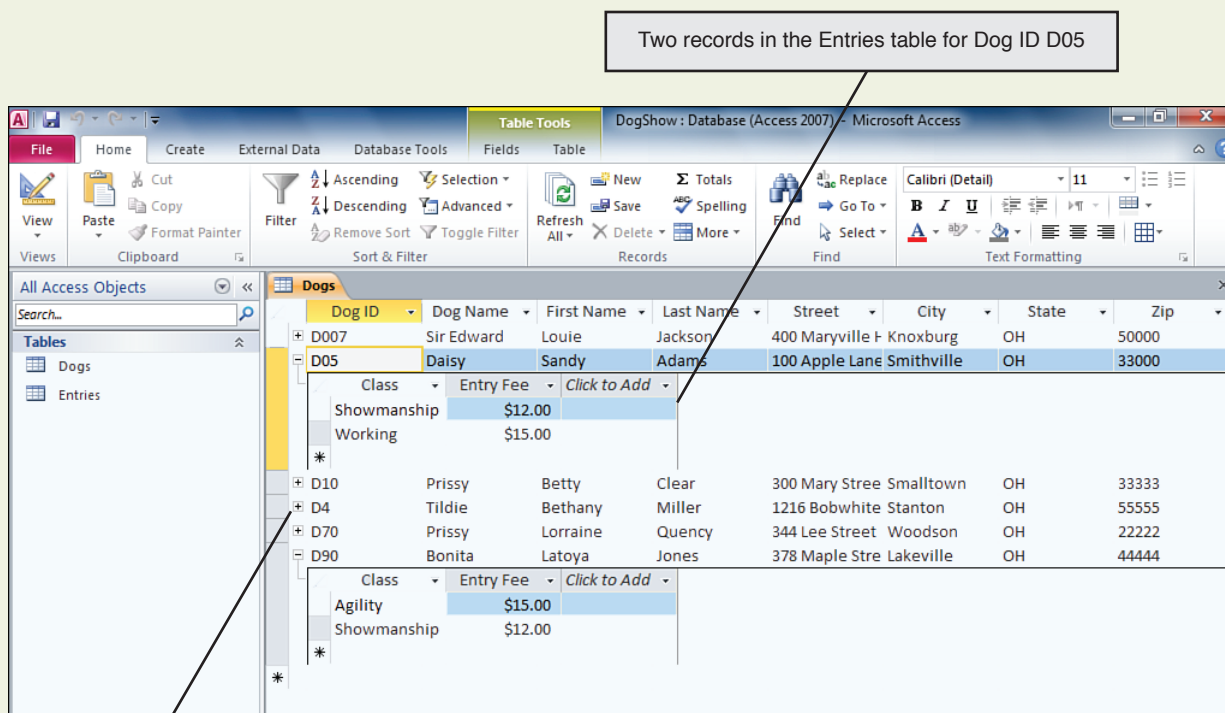

FIGURE A-13
A one-to-many relationship is built between the Dogs and Entries tables.

Not Working? If you make a mistake building the relationship and want to start over, click on the line between the tables and press the **Delete** key to delete the relationship between the tables.

On Your Own A-5
Relate Two Database Tables

Step 8. Double-click the **Dogs** table to open it. Notice the + to the left of each record. When you click the +, the related records in the Entries table appear (see Figure A-14). Close the **Dogs** table.

Two records in the Entries table for Dog ID D05

Click the + to see related records

FIGURE A-14
Related records in the Entries table appear under a record in the Dogs table.

Step 9. Open the **Entries** table. Try to enter a new record in the table that uses a Dog ID that is not found in the Dogs table. An error message appears, and the invalid entry is not allowed.

So far, you have seen how data integrity can be protected using a field's properties, using primary keys, and enforcing the one-to-many relationship between tables. Another useful tool to protect the data from errors is a **lookup field**. Let's use a lookup field to make sure the Class field always has valid entries.

> **lookup field**—A list of values allowed in a field. You can type the list, or you can specify a field in a table from which the list can be taken.

Do the following to allow only valid values in the Class field of the Entries table:

Step 1. Using the DogShow database, open the Entries table and go to Design view.

Step 2. Click in the Data Type box to the right of the Class field name. A drop-down arrow appears. Click the arrow and then click **Lookup Wizard** (see Figure A-15).

Select this item to set up a lookup field
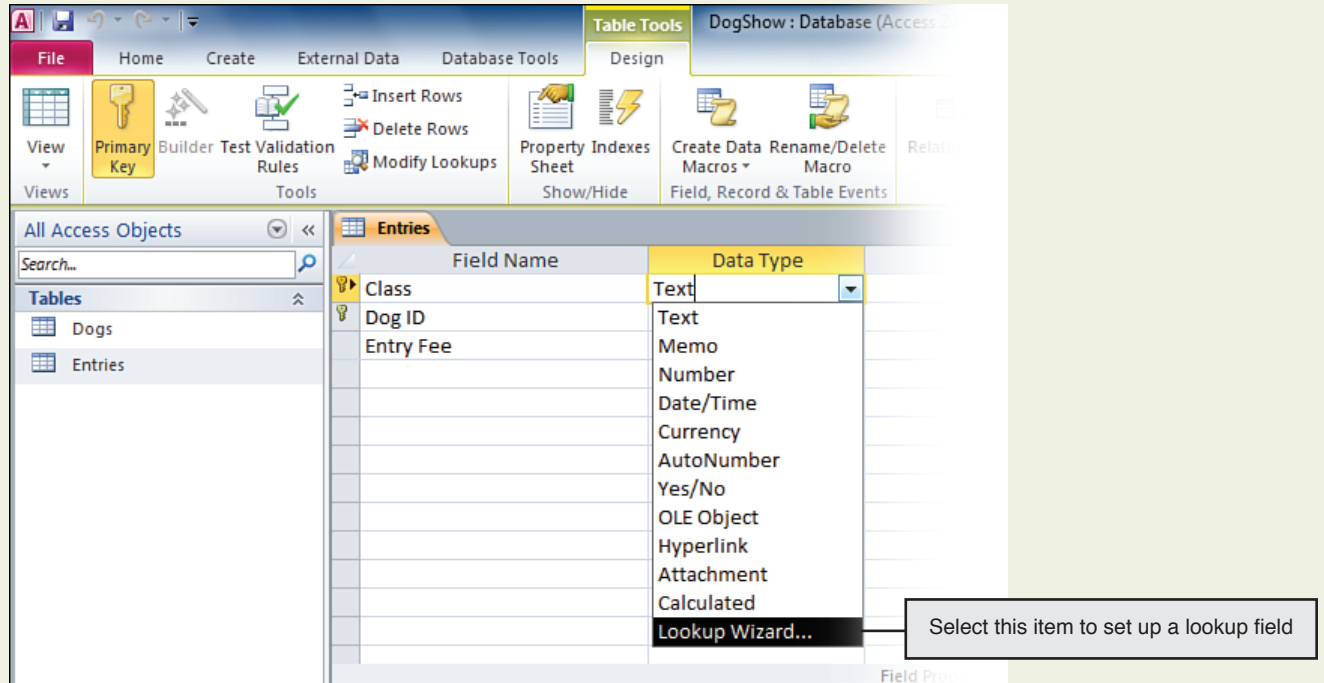
FIGURE A-15
Use the Lookup Wizard to create a list of values that are allowed into a field.

Step 3. The Lookup Wizard box appears. As you step through this wizard, you create a list of values allowed in the Class field. Select **I will type in the values that I want**. Click **Next**.

Step 4. In the next box, type the three classes in the dog show as shown in Figure A-16. Then click **Next**.
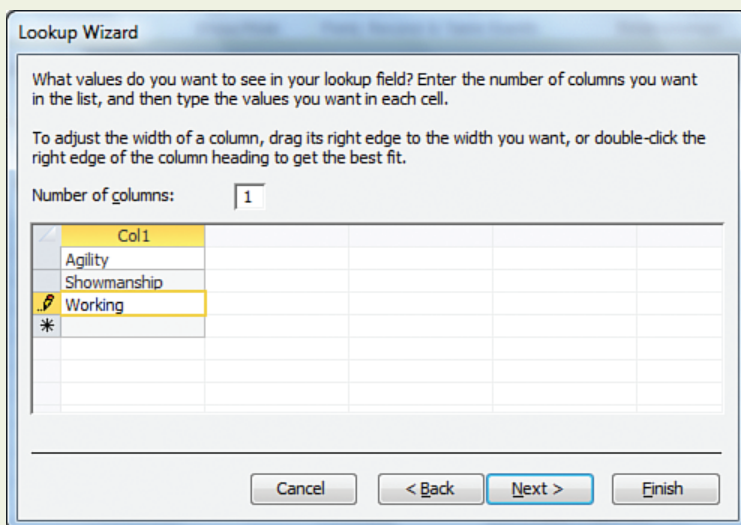
FIGURE A-16
Enter the values that you want to allow into the Class field.

Step 5. In the next box, check **Limit To List** and click **Finish**.

Step 6. Save your work and return to the **Datasheet view**.

Step 7. When you click in the Class field, a drop-down arrow appears. Use the drop-down arrow to see the lookup list (see Figure A-17). You can click your selection or type it. Only values from the list are allowed in the field. Close the **Entries** table.
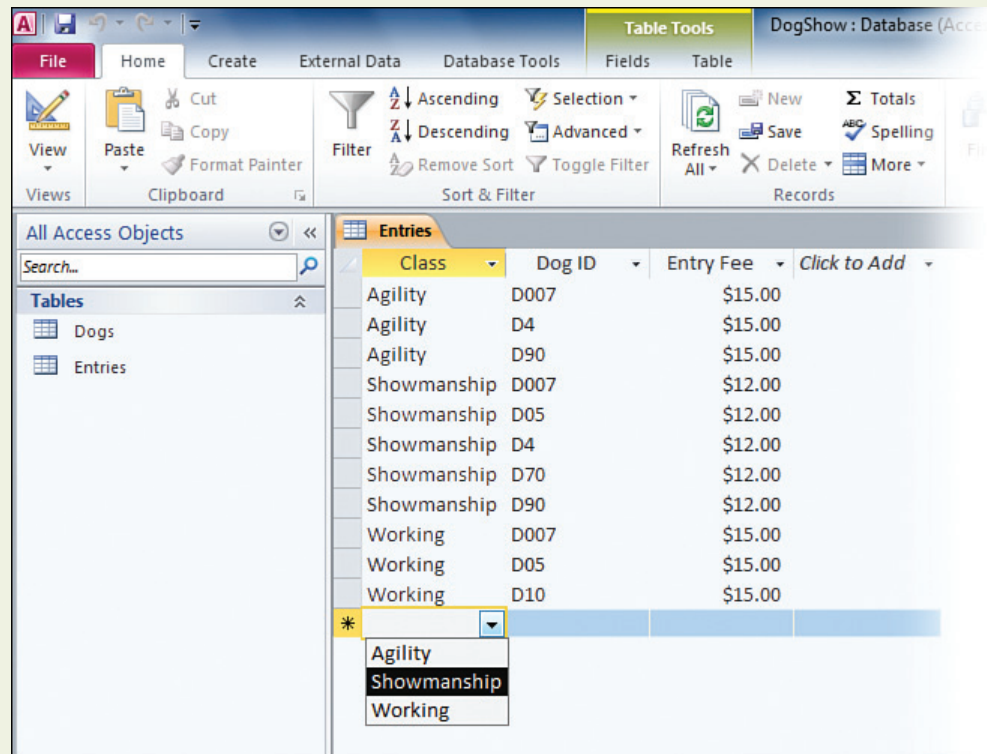

FIGURE A-17
Only values in the list are allowed into the Class field.

Now that you have learned how to create a database and protect the integrity of the data, let's see how forms can help you with data entry.

Creating and Using Forms

An Access **detailed form** displays one record at a time and is used to edit this record. You can select which fields appear on the form. Two other types of forms are the **multiple items form** and the **split form**.

detailed form—A form that displays one record at a time. To create the form, begin by clicking **Form** on the Create ribbon.

multiple items form—A form that displays more than one record at a time. The form is similar to the Datasheet view but gives more control over what the user can see and do. To create the form, click **More Forms** on the Create ribbon and then click **Multiple Items**.

split form—A form that is spilt on the screen. The top half displays one record, and the bottom half lists several more records. To create the form, click **More Forms** on the Create ribbon and click **Spit Form**.

When you first create a form, Access displays it in **Layout view**. You must switch to **Form view** before you can use the form to edit data.

Layout view—A view in Access where you can make design changes to a form or report. Live data displays in the form to help you with design changes, but you cannot edit the data.

**Form view**—A view in Access where a form can be used to edit data.

Two ways to switch views for the form are

▸ On the Design ribbon, click the drop-down arrow under View and then click **Form View** or **Layout View**.

▸ In the status bar at the bottom of the Access window, click the **Form View** or **Layout View** button.
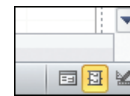
When you use Access to create forms, queries, and reports, Access stores the designs for these **database objects** in the .accdb database file along with the database tables. Each time you run a form, query, or report, Access fills or populates the object with data from the tables.

database object—A table, form, query, report, or macro that holds or manages the data in a database. Access stores all database objects in the .accdb file and lists these objects in the left pane of the Access window.
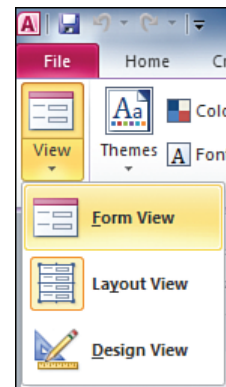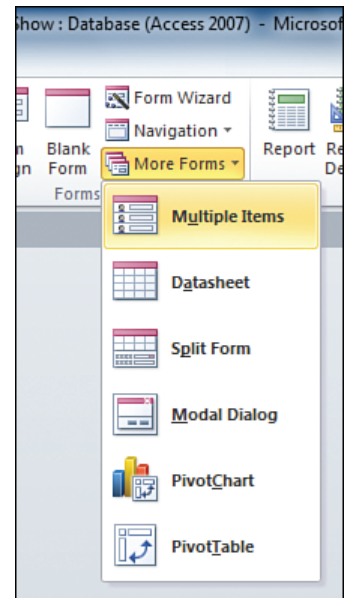
On Your Own A-7
Create and Use Detailed and Split Forms

In this activity, you create a detailed form to edit the Dogs table and a split form to edit the Entries table. When the activity is completed, the detailed form for the Dogs table should look like that in Figure A-18.

OneDog form is open and active

Fields in a single record can be edited

Two forms are listed as database objects

The form displays related records in the Entries table

Use these arrow buttons to step through records

Search box to find text in any record

Forms view is selected

FIGURE A-18
Use the OneDog form to edit a single record in the Dogs table.

Do the following to create and use a detailed form to edit the Dogs table:

Step 1. Select the **Dogs** table in the DogShow database. Click **Form** on the Create ribbon. The Dogs form is created. Save and name the form **OneDog**. Notice it is now listed in the left pane as one of the objects for this database. The form is displayed using the Layout view.

Not Working? Objects in a database (tables, queries, forms, reports, and macros) are listed in the left pane of the Access window. If you don't see an object, right-click in the pane and select **Navigation Options** from the shortcut menu. In the Navigation Options box under Object Type, make sure all object types are selected.

Step 2. To use the form to display and edit data, first switch to Form view. Then use the left and right arrows at the bottom of the form to step through the Dogs records. Go to the first and last records in the table. As you step through the Dogs records, notice the related records in the Entries table appear at the bottom of the Dogs form.

`Record: I◀ ◀ 1 of 7 ▶ ▶I ▶▣`

Step 3. Enter a new record in the table, making up your own data.

Step 4. Use the search box at the bottom of the form to search for the text **Betty**. Which record appears?

Step 5. Close the **OneDog** form, saving your changes.

Step 6. Open the Dogs table and verify the new record appears. Close the Dogs table.

Not Working? If you don't see the record, the Datasheet view might need refreshing. To refresh a view of the data, click **Refresh All** on the Home ribbon and then click **Refresh All**. You can also press the **F5** key to refresh the view.

On Your Own A-7
Create and Use Detailed and Split Forms

Not Working? The OneDog form provides two sets of arrow buttons used to step through records. One set applies to the Entries table and the other set applies to the Dogs table. Use the set at the very bottom of the form that applies to the Dogs table.

The split form to edit the Entries table is shown in Figure A-19.
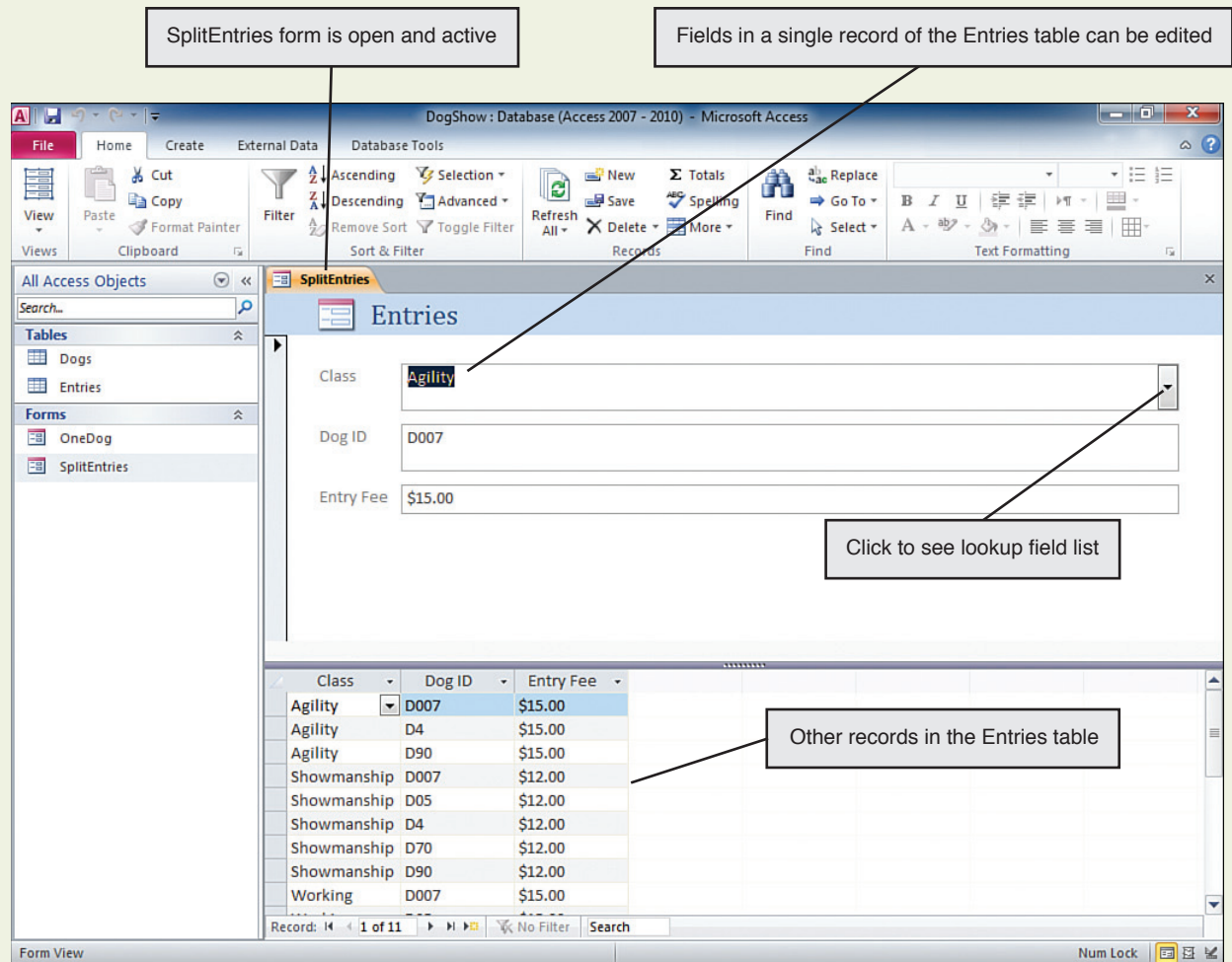
FIGURE A-19
Use the SplitEntries form to edit a single record in the Entries table and view multiple records.

On Your Own A-7
Create and Use Detailed and Split Forms

Do the following to create and use the form:

Step 1. Create a split form using the Entries table. Save the form, naming it **SplitEntries**.

Step 2. Using the Forms view, step through the records. Go to the first and last records, add a new record, and search for text in the Entries table.

Step 3. Close the **SplitEntries** form, saving your changes.

Step 4. Open the Entries table and verify the new record is displayed.

? Solutions Appendix

For help, see Solution A-7: How to Create and Use Detailed and Split Forms.

Creating and Using Queries

Earlier in the chapter, you learned to create a query using a single table in the AnimalShelter database. Now let's see how you can add a calculation to a query and build another query that uses two tables.

On Your Own A-8
Create a Query That Includes a Calculation

In this activity, you create the Fees query that calculates the sum of total fees paid. The completed query is shown in Figure A-20.

Fees query is listed as a database object

Total row with sum

FIGURE A-20
The Fees query includes the sum of total fees paid.

Create a Query That Includes a Calculation

Do the following to create the query:

Step 1. Using the DogShow database, click **Query Design** on the Create ribbon. The Show Table box appears. Add the **Entries** table to the query and close the Show Table box.

Step 2. Add all three fields in the table to the query.

Step 3. Save the query, naming it **Fees**. View the query using the Datasheet view.

Step 4. Using Design view, sort the records by Class. Return to Datasheet view and verify the rows in the query are sorted by Class.

Step 5. Add a total row to the query. In the total row, sum the Entry Fee column.

> **Hint** To add a total row to a query, click **Totals** on the Home ribbon. In the total row, add a sum in the appropriate column.

Solutions Appendix

For help, see Solution A-8: How to Create a Query That Includes a Calculation.

Step 6. Compare your query to that shown in Figure A-20. Your data might be different. Verify the Entry Fee column is summed in the Total row. Correct any problems you see. Save and close the query.

Create a Query That Uses Two Tables

In this activity, you create the ClassRoster query that uses the Dogs and Entries tables. The completed query is shown in Figure A-21. This query lists each entry sorted by classes and shows information from both tables. Later in the chapter, you use this query to create the Class Roster report that goes to the show ring master.
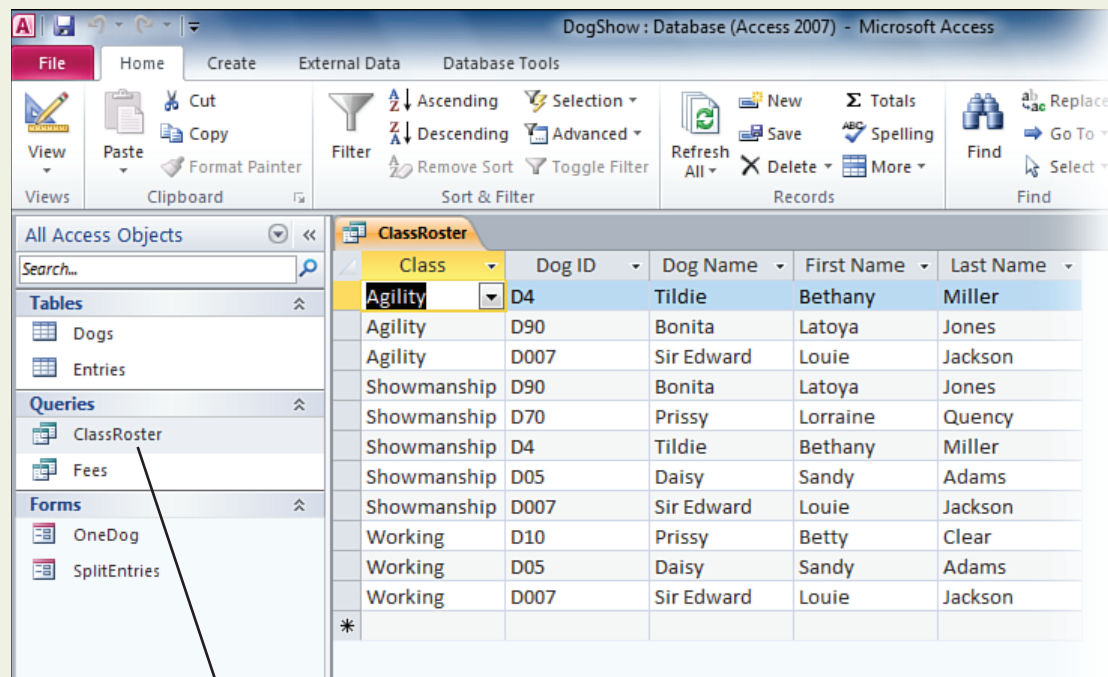
ClassRoster query is listed as a database object

FIGURE A-21
The ClassRoster query uses the Dogs and Entries tables and lists entries in each class.

Create a Query That Uses Two Tables

Do the following to create the query:

Step 1. Using the DogShow database, create a new query. Add the **Entries** table to the query first and then add the **Dogs** table to the query. The first table added to a query drives the number of records displayed by the query.

Step 2. Break the relationship between the two tables by deleting the line or lines between them. When you break the relationship, the query is free to establish a new relationship as needed.

Step 3. Press and drag the Dog ID field from the Entries table on the left to the Dog ID field on the Dogs table on the right. A line is drawn. Notice the line is not defined as a one-to-many relationship using the 1 and ∞ symbol. In fact, the relationship between Entries and Dogs is a many-to-one relationship.

Step 4. We want the query to show all records in the Entries table. To make this the rule, right-click the line and select **Join Properties** from the shortcut menu.
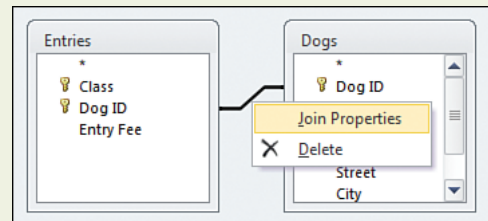
Step 5. The Join Properties box appears. Verify the Entries table is the Left Table Name and the Dogs table is the Right Table Name. Select **2: Include ALL records from 'Entries' and only those records from 'Dogs' where the joined fields are equal**, as shown in Figure A-22. Click **OK** to close the box. Notice the line between the tables is now an arrow pointing from Entries to Dogs.
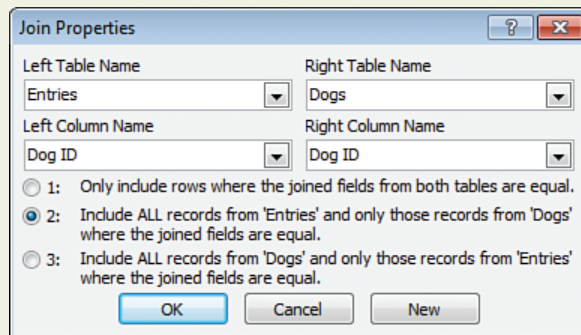
FIGURE A-22
The Join Properties box shows how records will be selected for a query.

Step 6. Add the following fields to the query in this order:

    a. Class in the Entries table

    b. Dog ID in the Entries table

    c. Dog Name in the Dogs table

    d. First Name in the Dogs table

    e. Last Name in the Dogs table

Step 7. Sort the record list in the query by **Class** in **Ascending** order.

Step 8. Save the query, naming it **ClassRoster**.

Step 9. Return to Datasheet view and view the results of the query. Check your work against Figure A-21 and correct any problems you see. Your data might be different from that shown. Verify that the number of rows displayed in the query is the same as the number of records in the Entries table. How can you tell how many records appear in the query without counting them?

> **Not Working?** If the number of records in the query is not correct, perhaps the problem is with the relationship between tables in the query. To verify this relationship, go to Design view and display the Join Properties box. The Join Properties box should look like that shown in Figure A-22.

Step 10. Close all open objects in the database.

Creating and Using Reports

An Access report can be used to present the data, charts, calculations, and other information about the data in a format appropriate for printing. You can use a database table to create a simple report or mailing labels. If the report uses data from multiple tables, it's easier to create a query first and then generate the report from the query.

Do the following to create mailing labels from the Dogs table:

Step 1. Open the Dogs table in the DogShow database. Make sure the Dogs tab is selected.

Step 2. On the Create ribbon in the Reports group, click **Labels**. The Label Wizard dialog box opens (see Figure A-23).
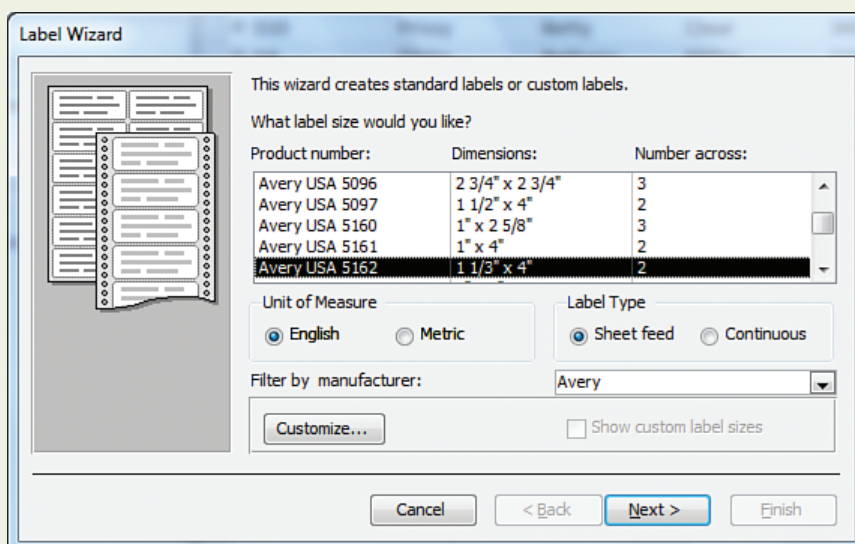
FIGURE A-23
The Label Wizard requires you to select how labels will print on the page.

Create Mailing Labels from a Single Table

Step 3. The first step is to select the size for the mailing labels, and many standards are listed. The standard you select depends on the mailing labels you intend to use. Figure A-24 shows peel-off mailing labels that come two across, 14 labels to a page. This is the Avery 5162 standard. Select the **Avery USA 5162** standard and click **Next**.
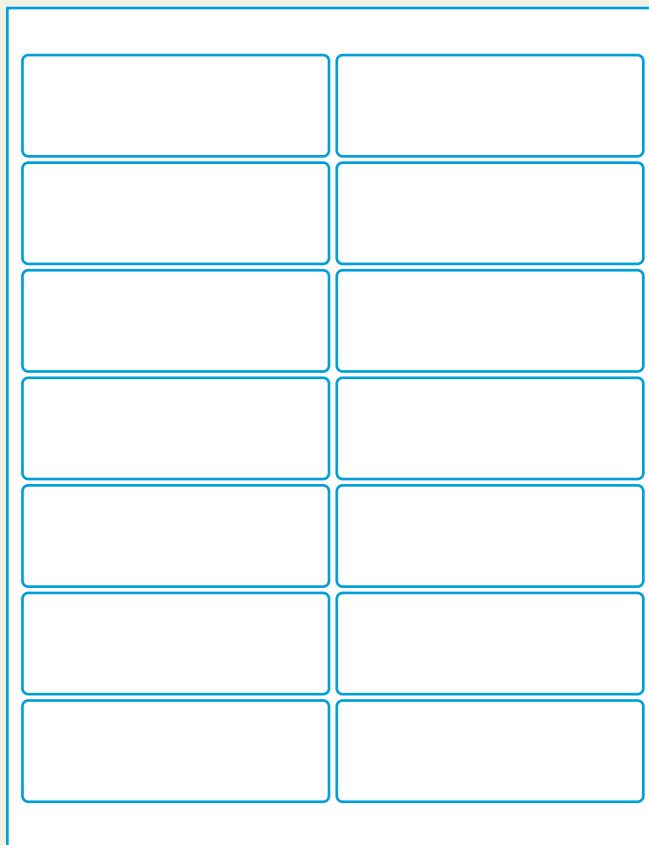
FIGURE A-24
These mailing labels are 4" × 1.33" and print two across and 14 to a page.

Step 4. On the next box, no changes are required for the font and color of text. Click **Next**.

Step 5. On the next box, you select the fields to go on each label (see Figure A-25). Under Available fields, double click **First Name** to place it on the label. The field is placed in the Prototype label box and is enclosed in braces { }. In the Prototype label box, type a space to insert a space following the first name. Double-click **Last Name** to insert this field. Press **Enter** to advance to the next line of the label.

Step 6. Double-click **Street** to place the field on the second line of the mailing label. Press **Enter** to advance to the third line.

Step 7. On the third line, place the **City** field. Type a comma and a space to place this text following the City field.

Step 8. Double-click **State**, type a space, and double-click **Zip** to complete the third line of the mailing label. The Label Wizard box should now look like that in Figure A-25. Click **Next**.
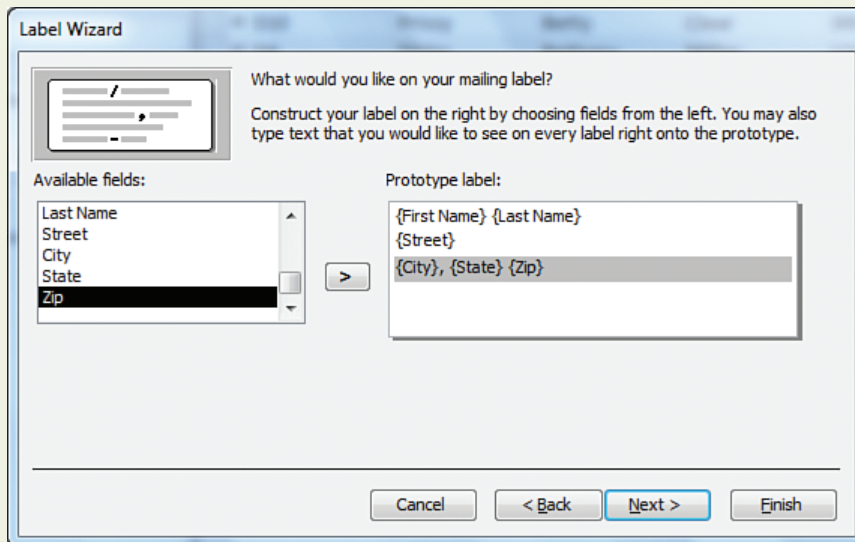
FIGURE A-25
Fields and text are placed on the Prototype label used to build each mailing label.

Step 9. On the next box, you can choose how the labels are sorted. Double-click **Last Name** and then double-click **First Name**. The labels will be sorted by last name and then first name. Click **Finish**.

Step 10. Mailing labels appear as shown in Figure A-26. Check your work and correct any problems you see.

Step 11. Save the mailing labels. Notice the labels are listed in the left pane as one of the database objects in the Reports group.

Create Mailing Labels from a Single Table
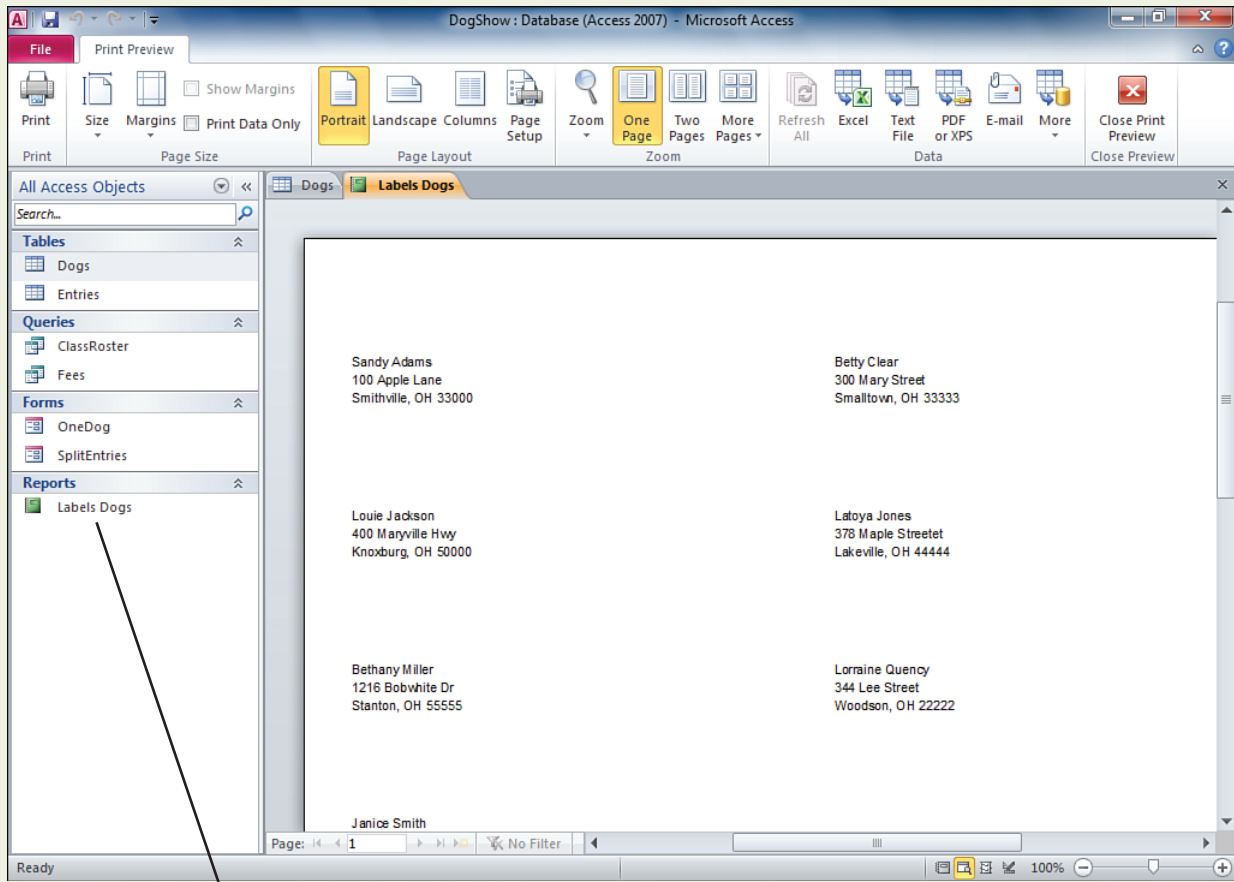
Labels Dogs report is listed as a database object

FIGURE A-26
Mailing labels will print two across and are sorted by last name and first name.

You can use the Report Wizard to create a report from multiple database tables. To start the Report Wizard, click Report Wizard on the Create ribbon. Another way to create a report from multiple tables is to start with a query that contains the data from multiple tables. The advantage of using an existing query for the report is that you already have part of the work done.

In this activity, you create the ClassRosterReport that will be printed and sent to the ring master during the show. The ring master is responsible for making sure only dogs on the roster are allowed in the show ring. The completed report is shown in Figure A-27.

On Your Own A-11
Create a Report from a Query
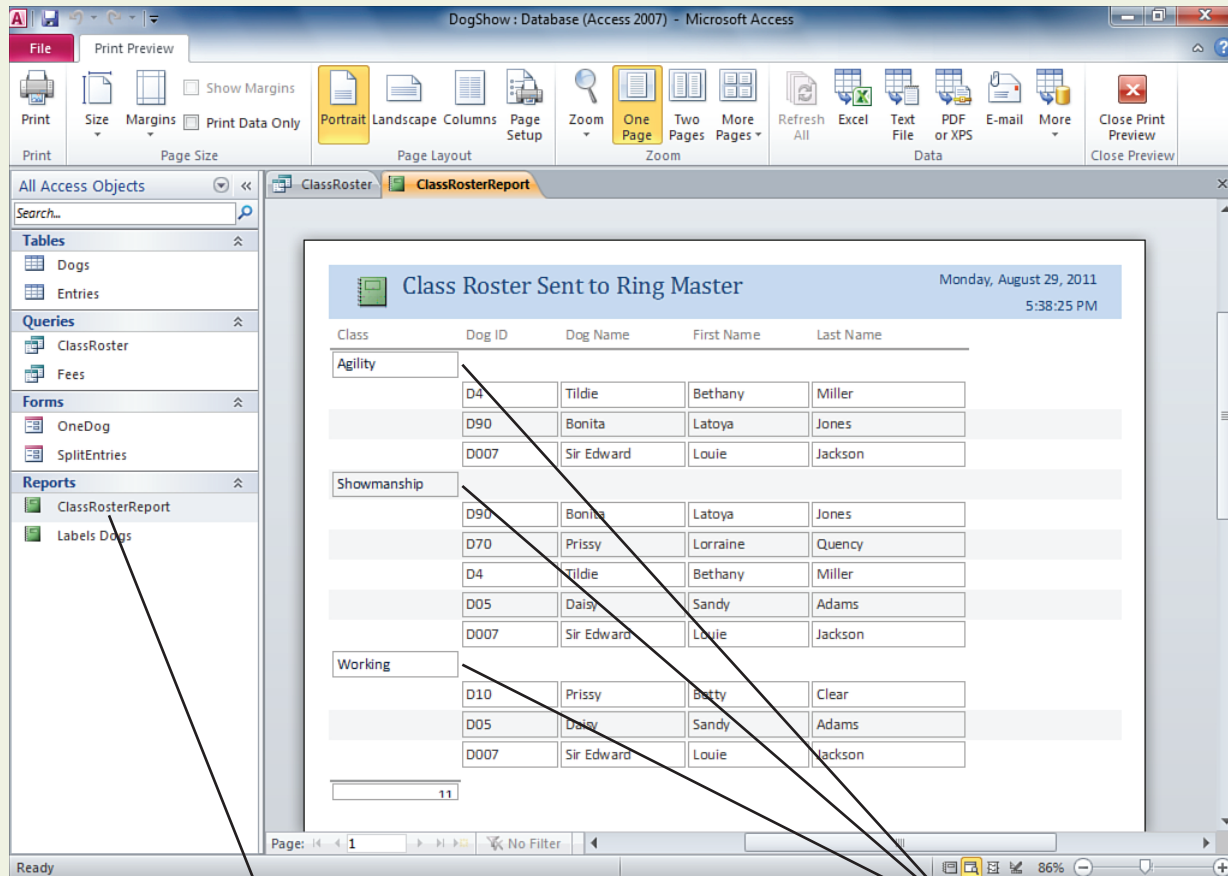
ClassRosterReport is listed as a database object

Group header appears for each Class group

FIGURE A-27
The Class Roster report lists dog entries sorted and grouped by Class.

Do the following to create the report:

Step 1. Using the DogShow database, open the **ClassRoster** query you created earlier in On Your Own A-9. Be sure the ClassRoster tab is selected.

Step 2. On the Create ribbon, click **Report**. A report is created using the selected query. Save the report, naming it **ClassRosterReport**. The report displays in the Access window in Layout view, where you can change the design of the report.

Step 3. The title at the top of the report is ClassRoster, which is the name of the query that created the report. Change the title to **Class Roster Sent to Ring Master**.

Step 4. Narrow the field widths so the fields do not spill off the page. To narrow a field width, first select the field box. The selected box has an orange line around it. Press and drag the edge of the box to resize it.

Step 5. Move the page number box at the bottom of the report to the left so it does not spill off the page. The design window should now look like that in Figure A-28.

Dotted line indicates the right margin of page

| ClassRoster | **ClassRosterReport** | | | | ✕ |

Class Roster Sent to Ring Master

Monday, August 29, 2011
5:21:38 PM

Class	Dog ID	Dog Name	First Name	Last Name
Agility	D007	Sir Edward	Louie	Jackson
Agility	D90	Bonita	Latoya	Jones
Showmanship	D007	Sir Edward	Louie	Jackson
Showmanship	D05	Daisy	Sandy	Adams
Showmanship	D4	Tildie	Bethany	Miller
Showmanship	D70	Prissy	Lorraine	Quency
Showmanship	D90	Bonita	Latoya	Jones
Working	D007	Sir Edward	Louie	Jackson
Working	D05	Daisy	Sandy	Adams
Working	D10	Prissy	Betty	Clear
Agility	D4	Tildie	Bethany	Miller

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FIGURE A-28
The report design window shows fields narrow enough to not spill off a page.

Step 6.   To sort the records by Class, use the **Group & Sort** command on the Design ribbon.

Step 7.   Group the records by Class so that a group header appears at the beginning of each group of Classes, as shown in Figure A-29.

Step 8.   Change to **Report View** to view the report with its data.

Step 9.   Change to **Print Preview** view to see how the report will look on the printed page.

Step 10.   Save the report and close it.

On Your Own A-11
Create a Report from a Query

A group was added that created the group headers
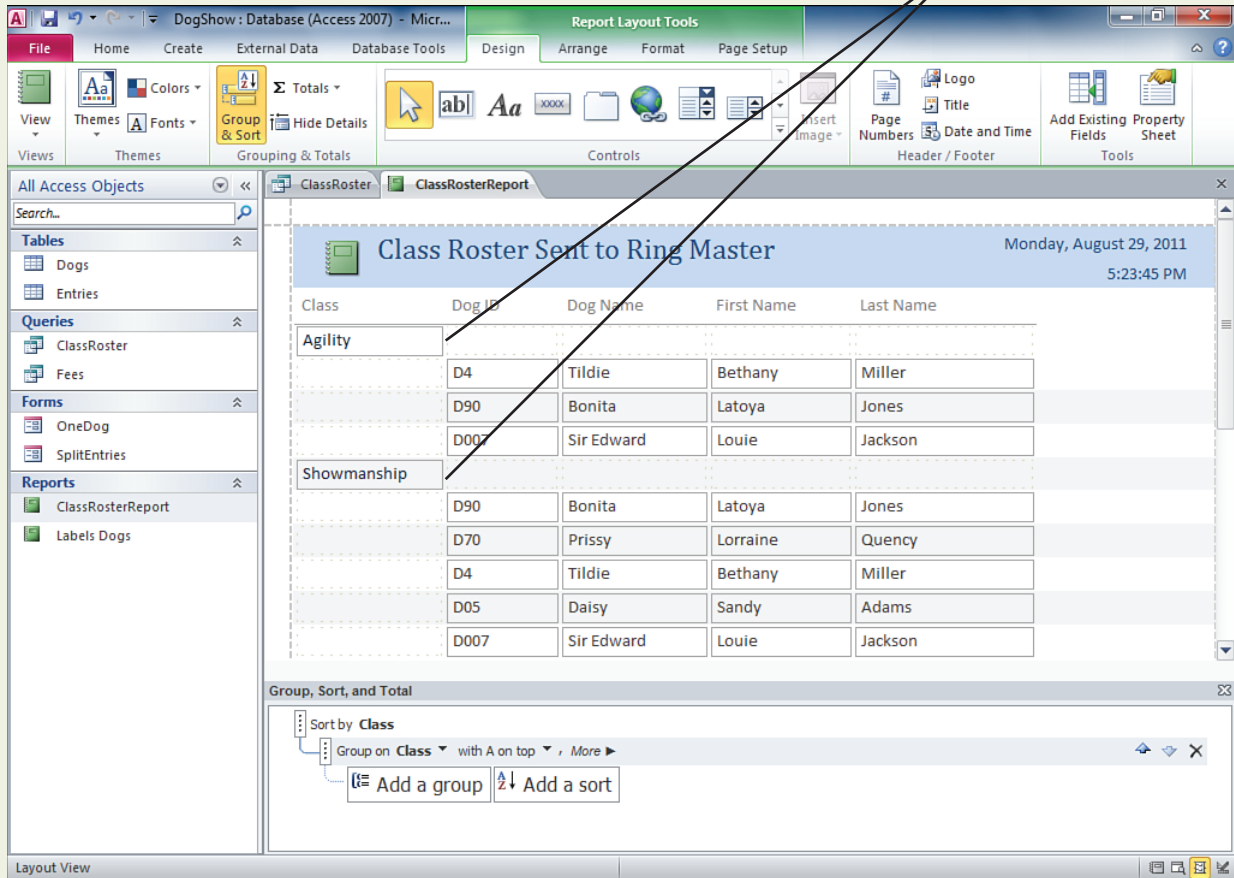
FIGURE A-29
Records are sorted by Class, and each Class has a group header.

Solutions Appendix

For help, see Solution A-11: How to Create a Report from a Query.

Summary

Using Access to Explore a Simple Database

► Microsoft Access is a database management system (DBMS) used to manage databases stored on a personal computer.

► A database keeps data in one or more tables. A table is made up of records (rows) and fields (columns). Each field has a field name (column heading).

► Access 2010 uses the .accdb file extension for a database file. The file contains the data tables, forms, reports, queries, and other objects used to store and manage the data.

► Each field in a database table is assigned a data type that determines what type of data can go into the field. Some data types are AutoNumber, Text, Number, Time/Date, and Currency.

► The Datasheet view is used to view and edit the data in a database table or query. The Design view is used to change the design of the table or query.

► One or more fields in a table are defined as the primary key for the table. The primary key uniquely identifies each record in the table. Access does not allow duplicate primary keys to be entered in a table.

► Field properties in Design view can be used to set validation rules to protect the integrity of the data allowed into the table.

► Using Datasheet view, you can sort and filter records in a table.

► A query is a view of the data that contains selected fields and records that match the criteria for the query. Calculations can be included in the query, and data displayed by a query can be edited.

► The left pane of the Access window is called the Navigation pane and lists all the objects in the database including tables, queries, forms, and reports. Open objects display in the right pane of the Access window.

Designing and Creating a New Database

► To design a database, first consider how you will use the information in the database and determine what queries and reports you need. Then decide what data items you must keep to produce these queries and reports.

► The next step to design a database is to decide how many tables you need in the database so as to avoid data redundancy. Start with sample data in a single table and then break out the data into two or more tables so that data is not duplicated.

► Breaking a table into two or more tables so as to avoid data redundancy is called normalizing the database.

► To determine the primary key for a table, identify a field or fields in the table that uniquely identify a record in the table.

► Two tables can be linked together using a field the tables have in common. The link is called a relationship. A relationship can be a one-to-many relationship or a many-to-one relationship.

► To create a new database in Access, name the database file and save it to a storage device. Then create each table in the database, assigning field names and data types to each field in a table. Entering sample data in the tables can help you visualize how queries, forms, and reports will look as you design these objects.

► After you have created the database tables with sample data, the next step is to create relationships between the tables.

► When you choose to enforce referential integrity in a database relationship, data is not allowed into a table unless it has a matching reference in the other table.

► A lookup field provides a list of values that are allowed into the field. You can set up a lookup field using the Design view for a database table.

Creating and Using Forms

▶ A form is used to view and edit data and provides more opportunity to protect the integrity of data than when editing data directly in a table.

▶ Three types of forms are a detailed form, multiple items form, and split form.

▶ You use the Form view to edit data and the Layout view to change the design of the form.

▶ A view of data might need refreshing so that latest changes to the data appear. To refresh the view, press F5 or click Refresh All on the Home ribbon and then click Refresh All again.

Creating and Using Queries

▶ A query displays records that match the given criteria. The query can include calculations, and records might be sorted. A query can use multiple tables in the database.

▶ Use the Totals command on the Home ribbon to add a total row to a query.

▶ Relationships between tables in a query apply only to the query. The Join Properties box for the relationship is used to specify how the relationship will work.

Creating and Using Reports

▶ Mailing labels can be created as one type of Access report. The Label Wizard is used to design the labels.

▶ A report can be created using the Report Wizard or using an existing query.

▶ The Report view is used to display data in a report. The Layout view is used to change the design of the report. The Print Preview view shows the report as it will look when printed.

▶ The Group & Sort command on the Design ribbon can be used to add groups to a report. First, sort the records in the report on a field and then group the report by this field. A group can have a group header that identifies the group.

Review Questions

Answer these questions to find out if you have learned the skills and concepts covered in the chapter. Your instructor can provide you with the correct answers when you are ready to check your work. If you answer most of the questions correctly, you are ready for the Chapter Mastery Project. If not, go back and review the chapter before you tackle the project.

1. Access is an example of a small-scale DBMS. Name two applications that are examples of a large-scale DBMS.

2. Name four types of objects that Access keeps in an .accdb database file.

3. Which view do you use to edit the data in a database table?

4. Which data type is best to use when zip codes are stored in a field?

5. By default, which field does Access make the primary key in a table?

6. Can you edit the data displayed in a query? In a form? In a report?

7. Suppose you are creating a query to display only those records that have a value in the Date Placed field. What is the criterion you must type in the Criteria row for the Date Placed field?

8. Suppose you are designing a database and have split the data items into two tables. When examining the sample data in the second table, you discover data is repeated in many records. What do you do next?

9. When you are designing a table listing dogs, why is it not a good idea to make the name of a dog the primary key for the table?

10. What is a database called that has tables linked together using a field they have in common?

11. If Table A has one record that links to many records in Table B, what type relationship is the link from Table A to Table B?

12. If Table A has many records that link to one record in Table B, what type relationship is the link from Table A to Table B?

13. Can you create a relationship between two tables stored in different databases?

14. Name three types of forms used in Access.

15. Why is it more convenient to create a report from an existing query rather than using the Report Wizard?

Chapter Mastery Project

Find out how well you have mastered the content in this chapter by completing this project. If you can answer all the questions and do all the steps without looking back at the chapter details, you have mastered this chapter. If you can complete the project by finding answers using the Access Help window or the web, you have proven that you can teach yourself how to use Access.

If you find you need a lot of help doing the project and you have not yet read the chapter or done the activities, drop back and start at the beginning of the chapter and then return to this project.

Mastery Project Part 1: Using Access to Explore a Simple Database

If you need help completing this part of the mastery project, review the "Using Access to Explore a Simple Database" section in the chapter.

Do the following to explore the AnimalShelter database on the DVD:

Step 1. Copy the AnimalShelter database in the Extra Chapters folder on the DVD to your USB flash drive, hard drive, or another location given by your instructor.

Step 2. Using Microsoft Access, open the AnimalShelter database you just copied to a new location. Open the **Animals** table. Add a new record to the table, making up your own data. Why is it necessary to copy the AnimalShelter database from the DVD to another storage device before you edit the Animals table?

Step 3. Use the Design view to display the data types for each field in the Animals table. What is the data type for the Weight field? The Date Received field?

What field is the primary key for the Animals table?

What is the data type for the Gender field?

Step 4. Change the Field Properties for the Gender field so that a value is required in this field. Which Field Property did you change?

Step 5. Return to Datasheet view and add a new record. What happens if you try to skip the Gender field and not enter a value in this field?

Step 6. Filter the records so that only Dogs are listed. Sort the records by Animal Name.

Step 7. Remove the filter and sort the records by Animal ID.

Step 8. Delete one record from the table. Save your changes to the Animals table.

Do the following to create a query using the Animals table:

Step 1. Create a query using the Animals table. Save the query, naming the query **Cats**. Include in the query **Animal ID**, **Animal Type**, **Animal Name**, **Gender**, and **Date Received**.

Step 2. Add criteria to the query that displays only records with "Cat" in the Animal Type field.

Step 3. Sort the records in the query by Animal Name.

Step 4. Save the query. Go to Datasheet view and verify only records for cats are listed and the records are sorted by Animal Name.

Step 5. Close the AnimalShelter database, saving your changes.

Mastery Project Part 2: Designing and Creating a New Database

If you need help completing this part of the mastery project, review the "Designing and Creating a New Database" section in the chapter.

Figure A-30 shows two tables used by Adams Hardware Store to manage its inventory. The Suppliers table has one row for each supplier. Each supplier is identified by a Supplier ID. The Inventory table has one row for each inventory item, which is identified by a SKU. (SKU stands for Stock-Keeping Unit.)

Suppliers

Supplier ID	Supplier	Street	City	State	Zip
BH	Boom's Hardware	1827 South Oak St	Topeka	KS	66607
CSC	Cali Supply Company	1291 North 18th St	Akron	OH	44305
FT	Fiesta Tools	382 Hill St	Cimarron	NM	87714
HSUSA	Hardware Supplies USA	839 Lakeview Blvd	Dallas	TX	75201
OS	Oriental Suppliers	300 Industrial Way	Northcutt	FL	30049
TT	Timely Tools	283 Parkway St	Alexandria	VA	22307

Inventory

SKU	Description	Department	Supplier ID	Wholesale Price	In Stock	Minimum
BH002	Drill, corded	Power tools	BH	22.00	3	2
BH0020	Blades, copping saw	Hand tools	BH	3.88	6	2
BH0025	Blades, hacksaw	Hand tools	BH	2.06	2	3
BH0010	Axe, single headed	Hand tools	BH	18.88	0	4
BH0011	Axe, wedge	Hand tools	BH	17.67	2	2
BH0015	Axe head repair kit	Hand tools	BH	3.21	1	1
CSC0017	Measuring tape, 120'	Measuring	CSC	14.40	0	3
CSC0045	Blades, circular saw	Hand tools	CSC	4.44	2	3
CSC0046	Measuring tape, 60'	Measuring	CSC	10.00	8	4
CSC0050	Clamps, quick release	Hand tools	CSC	7.63	5	6
CSC0330	Saw, handsaw	Hand tools	CSC	9.70	7	5
FT00001	Axe, double headed	Hand tools	FT	22.38	2	1
FT00002	Axe, fiberglass	Hand tools	FT	31.26	3	2
FT00040	Blades, jigsaw	Hand tools	FT	2.61	1	1

FIGURE A-30
Two tables are used to manage inventory for a hardware store.

Answer the following questions:

1. What is the primary key for the Suppliers table? For the Inventory table?

2. What field can you use to relate the two tables?

3. What type relationship is the link from the Inventory table to the Suppliers table?

Do the following to create the HardwareStore database:

Step 1. Create the HardwareStore database on your USB flash drive, hard drive, or another location given by your instructor.

Step 2. Create the Suppliers table, which has these fields:

    a. Supplier ID, data type Text

    b. Supplier, data type Text

    c. Street, data type Text

    d. City, data type Text

    e. State, data type Text, two characters only

    f. Zip, data type Text, five characters only

Step 3. Create the Inventory table, which has these fields:

    a. SKU, data type Text

    b. Description, data type Text

    c. Department, data type Text

    d. Supplier ID, data type Text

    e. Wholesale Price, data type Currency

    f. In Stock, data type Number

    g. Minimum, data type Number

Step 4. Create a relationship between tables. Link the Inventory table to the Suppliers table using a many-to-one relationship. Enforce referential integrity so that a user cannot enter a value for the Supplier ID in the Inventory table that does not have a match in the Suppliers table.

Step 5. Enter sample data into the Suppliers table. You can use the data shown in Figure A-30 or make up your own data.

Step 6. Enter sample data into the Inventory table. You can use the data shown in Figure A-30 or make up your own data. (You don't need to enter all the data shown in Figure A-30.) Be sure to use one of these values in the Department field:

    ▶ Hand tools

    ▶ Measuring

    ▶ Power tools

Step 7. Verify that when you attempt to enter a value in the Supplier ID field in the Inventory table that does not have a match in the Suppliers table, an error message appears and you are not allowed to continue until you enter a valid value.

Step 8. View the Suppliers table in Datasheet view. Verify that when you click the + beside a record, you can view related records in the Inventory table.

Step 9. View the Inventory table in Design view. Create a lookup field for the Department field. The possible values for the Department field are Hand tools, Measuring, and Power tools. Require that only these three values be allowed into the field.

Step 10. Save your changes and return to the Datasheet view. What happens when you attempt to enter a value other than values in the lookup list in the Department field?

Mastery Project Part 3: Creating and Using Forms

If you need help completing this part of the mastery project, review the "Creating and Using Forms" section in the chapter.

Do the following to create forms to use with the HardwareStore database:

1. Create a detailed form using the Suppliers table. Name the form **OneSupplier**. Go to Form view and use the form to step through records in the Suppliers table. What appears at the bottom of the form pane as you step through the Suppliers records?

2. Using the Form view, add a new record to the Suppliers table.

3. Open the Suppliers table in Datasheet view. Verify you can see the new record. If you don't see the record, what can you do to refresh the Datasheet view?

4. Create a split form to edit the Inventory table. Save the form, naming it SplitInventory. Go to the Form view and use the form to step through records in the Inventory table. What appears at the bottom of the screen as you step through the Inventory records?

5. Close all open tables and forms, saving your changes.

Mastery Project Part 4: Creating and Using Queries

If you need help completing this part of the mastery project, review the "Creating and Using Queries" section in the chapter.

Figure A-31 shows a query taken from the Inventory table. The query includes a calculated column named Investment. The value in this column is the money invested in an item, which is Wholesale Price multiplied by In Stock. The column is summed in a total row at the bottom of the query.

FIGURE A-31
The Investment query has a calculated column and total row.

Do the following to create the query:

Step 1. Create a query using the Inventory table. Add the SKU, Description, Wholesale Price, and In Stock fields to the query. Name the query **Investment**.

Step 2. The fifth column is named Investment and has a calculation in it. To create the column, in the fifth column of the query, right-click the Field row and select **Zoom** from the shortcut menu. In the Zoom box, type the following and click **OK**:

Investment: [Wholesale Price]*[In Stock]

Step 3. The calculated column is added to the query. Save the query and run it. The Investment column shows the product of Wholesale Price and In Stock for each inventory item.

Step 4. Add a total row to the query and put in it the sum of the Investment column. The query should look like that in Figure A-31. Your data might not be the same as that in the figure. Save your changes.

The next query uses the Inventory and Suppliers table and is a list of all items that need to be ordered from suppliers. An order is made if the number in stock drops below the minimum. The number to order is three times the minimum less the number in stock. The query results are shown in Figure A-32.

Calculated column

FIGURE A-32
The NewOrders query lists items that need to be ordered and the quantity to order.

Do the following to create the query:

Step 1. Create a query using the Inventory table and the Suppliers table. Break the link between to the two tables. Save the query, naming it **NewOrders**.

Step 2. Create a new link from Inventory to Suppliers using the Supplier ID field. Open the Join Properties box and select **2: Include ALL records from 'Inventory' and only those records from 'Suppliers' where the joined fields are equal**.

Step 3. From the Inventory table, add the SKU, Description, Supplier ID, In Stock, and Minimum fields to the query.

Step 4. Right-click in the Field row of the sixth column and select Zoom from the short-cut menu. In the Zoom box, type the following and click **OK**:

Order: [Minimum]*3-[In Stock]

Step 5. Add to the query the Supplier field from the Suppliers table.

Step 6. The criterion for the query is that the In Stock value is less than the Minimum value. In the In Stock column and the Criteria row, enter the following:

<[Minimum]

Step 7. The query Design view should look like that in Figure A-33. Save your changes and run the query. Results should be similar to that shown in Figure A-32. Your data might be different from that in the figure.

Calculated column

Criteria for the query
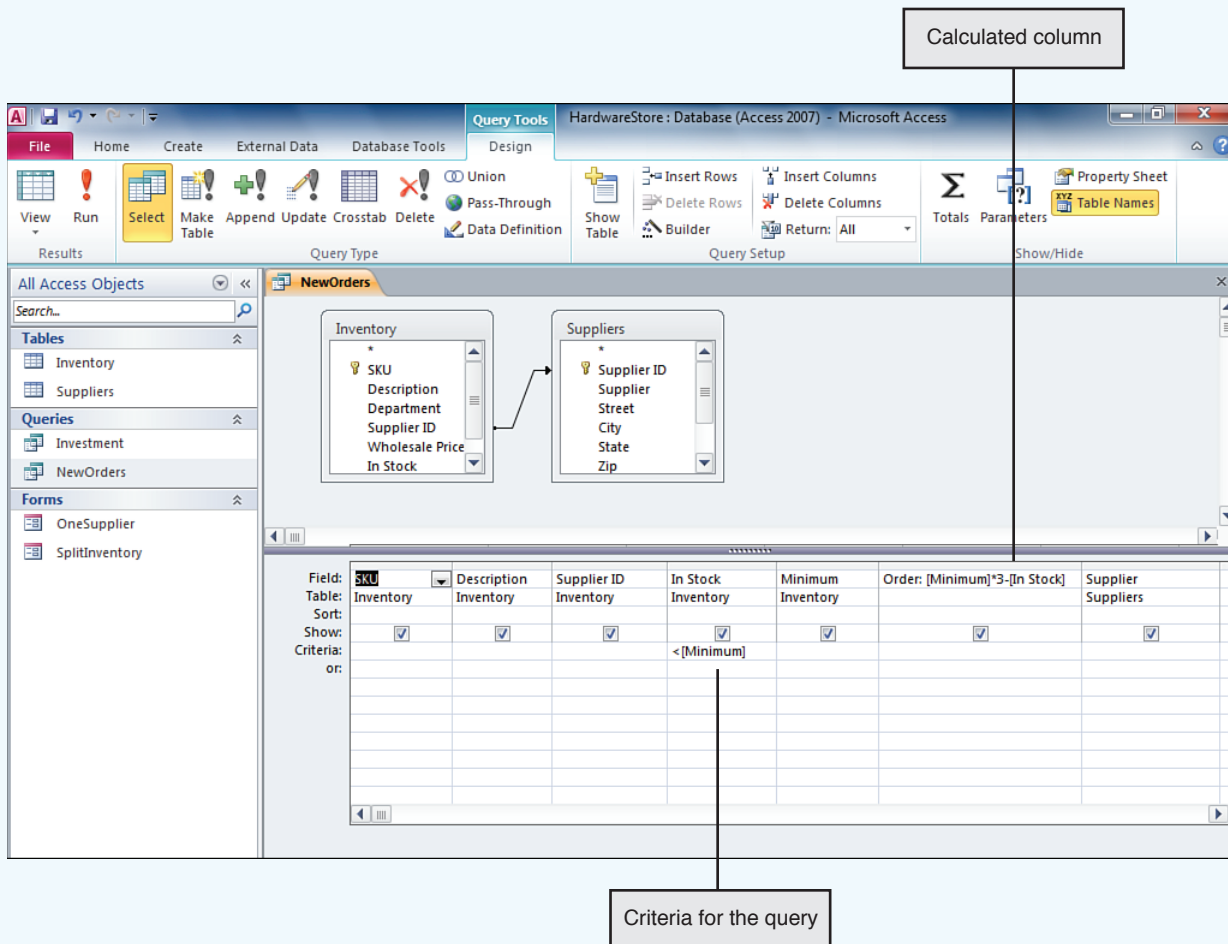
FIGURE A-33
The Design view of the query shows one calculated column and the criteria for the query.

Mastery Project Part 5: Creating and Using Reports

If you need help completing this part of the mastery project, review the "Creating and Using Reports" section in the chapter.

Do the following to create mailing labels and a report for the HardwareStore database:

Step 1. Using the Suppliers table, create mailing labels for all suppliers. Use the **Avery USA 5160** standard, which is 1" × 2 5/8" and three across the page. Include on the mailing labels the Supplier, Street, City, State, and Zip. Don't forget the comma and spaces between City, State, and Zip. Sort the labels by Supplier. The mailing labels are shown in Figure A-34. Your data might be different.

Boom's Hardware 1827 South Oak St Topeka, KS 66607	Cali Supply Company 1291 North 18th St Akron, OH 44305	Fiesta Tools 382 Hill St Cimarron, NM 87714
Hank House Tools 300 Maple Street Atlanta, GA 33333	Hardware Supplies USA 839 Lakeview Blvd Dallas, TX 75201	Timely Tools 283 Parkway St Alexandria, VA 22307

FIGURE A-34
Mailing labels to suppliers print three across the page.

Step 2. Create a report using the NewOrders query. Save the report, naming it NewOrdersReport. Change the title of the report to **Orders to Suppliers**.

Step 3. Adjust field widths so the report does not spill off the page on the right side. Sort records by Description. Display a print preview of the report, which should look like that in Figure A-35. Your data might be different.

Orders to Suppliers

Thursday, September 01, 2011
3:15:13 AM

SKU	Description	Supplier ID	In Stock	Minimum	Order	Supplier
BH0015	Axe head repair kit	BH	1	5	14	Boom's Hardware
FT00001	Axe, double headed	FT	2	6	16	Fiesta Tools
CSC0045	Blades, circular saw	CSC	0	7	21	Cali Supply Company
BH0025	Blades, hacksaw	BH	2	5	13	Boom's Hardware
FT00040	Blades, jigsaw	FT	1	5	14	Fiesta Tools
CSC0050	Clamps, quick release	CSC	5	6	13	Cali Supply Company
BH003	Drill, rechargeable 18volt	BH	5	8	19	Boom's Hardware

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FIGURE A-35
The NewOrder query is used to create the Orders to Suppliers report.

Projects to Help You

Now that you have mastered the material in this chapter, you are ready to tackle the three projects introduced at the beginning of the chapter in the section "How Will This Chapter Help Me?"

Project 1: Comparing Access and Excel

In Chapter 11, you learned how the Gently Used Consignment Shop uses worksheets to track inventory, sellers, commissions, and monthly reports to sellers. Design a database to track the same information. Decide what tables the database should have and what fields should go in each table. Identify and design each query and report needed for the database. Use Access to create the database tables and enter sample data into the tables.

Answer the following questions:

1. How many tables are in your database? What is the primary key of each table?

2. If you were responsible for managing the consignment shop data, which application would you prefer to use to manage the data, Access or Excel? Explain your answer.

3. If you were to choose Access for the job, what new skills in Access would you need to learn that you do not yet know?

PERSONAL PROJECT: I've kept records for a small business using Excel, and I want to convert this data to an Access database. How do I design and set up the database using my worksheets to guide me?

Project 2: Access in Your Academic Career

Compare the Hardware Store database you created in the Chapter Mastery Project in this chapter to the Hardware Store worksheets you created in the Chapter Mastery Project of Chapter 11. Answer the following questions:

1. How is a table in Excel similar to a table in Access? How are they different?

2. How is a table in Excel similar to a query in Access? How are they different?

3. How is a worksheet in Excel similar to a report in Access? How are they different?

4. Which application do you think is easier to use to manage the hardware store data, Access or Excel? Explain your answer.

5. If you were responsible for managing the hardware store data, would you use Access or Excel to do the job? Why?

ACADEMIC PROJECT: I need to understand how Excel and Access are the same and how they are different. When is it best to use Excel, and when do I use Access? Access seems to be more complicated, but maybe my work needs a more complicated solution.

Project 3: Access in Your Technical Career

A technician is often asked how to move data from one application to another. If you are asked this question and don't know the answer, you can investigate and teach yourself. Do the following:

Step 1. Suppose a user has entered data into a table using Word and wants to import that data into an Access database. Research and find out how to import data from Word into Access. You can search Access Help or the web, or you can explore and try commands on the External Data ribbon in Access.

Hint Text can be imported from a plain text file into an Access database. The fields in the text file are separated using a comma, and the file is called a comma-delimited text file. The Layout ribbon in Word can be used to create a comma-delimited text file. First, select the table and then click **Convert to Text** on the Layout ribbon.

TECHNICAL CAREER PROJECT: A client has stored a lot of data in Word tables and now she wants to move that data into an Access database. She has asked me to help her figure it out. How do I begin?

Step 2. Test your skills by using the HardwareSuppliersTable.docx file in the Sample Files folder on the DVD. Convert the data in this table to a comma-delimited text file.

Step 3. Open an Access database. On the External Data ribbon, click **Text File** and follow directions onscreen. Import the comma-delimited text file into the Access database.

Project to Help Others

One of the best ways to learn is to teach someone else. And, in teaching someone else, you are making a contribution into that person's life. In this chapter, help someone learn to use Access. Who is your apprentice? _____

Working with your apprentice, do the following:

Step 1. Explain to your apprentice a little about Access and how it works to manage data in a database using tables, forms, queries, and reports. Use the database examples in this chapter to demonstrate how to use a table, form, query, and report.

Step 2. Review with your apprentice how data can also be managed using Excel worksheets. Discuss with him when it might be appropriate to use Excel and when it might be appropriate to use Access to manage data.

Step 3. What conclusions did you and your apprentice reach about which tool to use in different situations?