

# 6 INTRODUCTION TO THE ACCESS DATABASE

## Keeping student records

### LEARNING OUTCOMES

In this tutorial you will learn about databases in general and about the *Office 2010 Access* database in particular. The concept of a database is not quite as easy to grasp as that of a word processor or a spreadsheet. So if this is the first time you are learning about databases you might like to read over the lesson first, away from the computer, and perhaps highlight the text to ease understanding.

Specifically this tutorial will introduce you to the following:

- the general idea behind a database
- planning a new database
- creating a database template
- adding records to a new or existing database
- viewing the data in a database
- clearing entries and records from a database
- making a backup copy of a database

**A caveat before you begin:** You'll find it easiest to use the tutorial if you follow the directions carefully. On computers there are always other ways of doing things, but if you wander off on your own be sure you know your way back!

### 6.1 AN OVERVIEW OF THE DATABASE CONCEPT

The database component of Microsoft *Office 2010* is designed to act as an "intelligent"<sup>1</sup> filing cabinet. Like a manual filing cabinet, it enables you to:

- collect together sets of related data and, if you are careful and conscientious, keep the data organized;

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<sup>1</sup> The word "intelligent" is enclosed in quotes so as not to create a false impression. With regard to computers, the word is overused, and strictly speaking inappropriate. It also can be misleading. The only "intelligence" exhibited by these otherwise "dumb" machines has been programmed into them by intelligent human beings.

- update the data once you've collected them, adding or deleting records, or changing the contents of existing records;

A database, however, is an *electronic* filing cabinet which makes it easy for you to quickly *work with* the data—sort them, create reports, merge the data with other documents, and so forth.

### How is a database organized?

*Access* is an object-oriented relational database management system. *Access* is designed to help an organization such as a company or an institution such as a school or school district, or even an individual teacher, collect, organize, manage, and access data in such a way that it can be easily accessed and made available to users in a variety of useful ways.

The database objects that you can create using *Access* are listed in *Access* Objects menu in the left hand frame of the database illustrated in Fig. 6.1. Let's take a look at each of these objects now to see how they can be used to help you organize and access the information collected into a database (in this case a database of information about different birds).

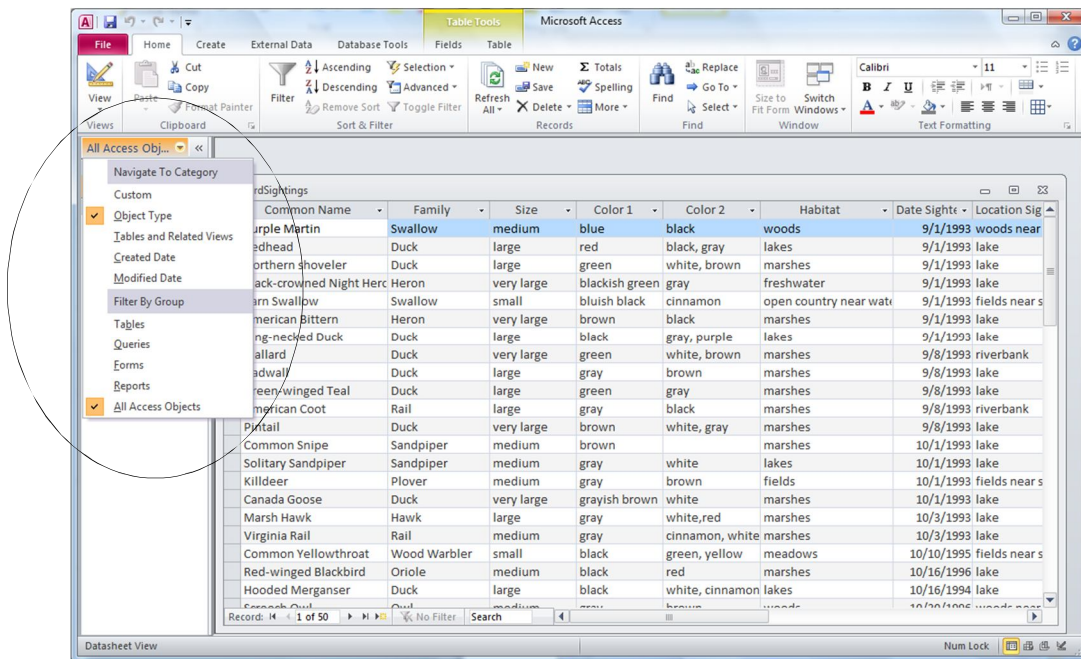


Fig. 6.1 The Access database objects

- A **Table** is the fundamental object in a relational database and tables use rows and columns to present the data—rather like a spreadsheet. For this reason, when you view the data as a table in an Access database, you are in what Access calls a *Datasheet View*. You will learn about Tables and Datasheets in this lesson, as well as how to use the Design View to create a table, add fields to a table, and define the type of data that is in a specific field.
- A **Form** gives the user another way of looking at the data in the database. Whereas a Table allows the user to view many records at once, a Form displays the contents of just one record at a time. Forms are very useful for entering data into new records or updating the data in existing records. You will learn about Forms in this lesson, too.
- A **Report** is used to present a selected set of information from a database in a format that is neatly laid out and thus easier for the user to mentally digest. You will learn about reports in Lesson 7.

- A **Query** makes a request to the database, asking it to find some specific data that are stored in the database. You will learn about queries in Lesson 7, too.

### **The general terminology used to describe data storage**

Words are our stepping stones to knowledge. For the most part, personal computers today still use electronic disks and drives of one sort or another to store data. The *Windows* computer operating system, like other operating systems, organizes data hierarchically on the disk using documents or files which are usually stored in directories or subdirectories that are part of the overall directory file management system.

Within documents, different terminology is used to describe the organization of data depending on the type of document in question.

- *Word processed* documents organize the data (mostly text) in paragraphs and sentences;
- *Spreadsheet* documents organize the data (mostly numbers) in rows and columns;
- *Databases* organize the data (of all kinds) into records and fields.

### **Access database terminology**

An *Access* database is able to contain thousands, hundreds of thousands, even millions of records, depending on the purpose for which the database has been designed. A teacher may have dozens of records in his or her class databases; a school district may well have hundreds or thousands of records to collect and maintain; a company like IBM will have hundreds of thousands of records, maybe even millions of records in multiple databases containing information about employees and other kinds of data; a US government office, such as the IRS, will surely have databases with millions of records.

Maintaining masses of data such as this is hard. Actually, maintaining even small amounts of data is hard, so it's not surprising that the computer has been brought to the rescue of those of us who want to manage data.

To avoid a hodge-podge of data organized at random, people have come up with the idea of organizing data into records. Records contain fields. Each field contains entries made up of text and numbers, which are the basic building blocks of data.

For example, let us say you have given a student an assignment to study birds and to build a database to store the data collected. The student decides to set up a record for each bird sighted.

Each record will include several field names, such as Common Name of the bird, Type (Family) of the bird, Size of the bird, Habitat, etc. A field name such as Common Name, for example, might contain the entry "Seagull" or "Red Ibis."

A database thus contains records; records have fields; the fields contain entries. These entries are made accessible by the Data View (Table), Form, and Report functions of the *Access* database. At the end of a school year, for example, a student would be able to use the word processor (Word) to write a relatively sophisticated paper, and merge into the paper some of the data collected in the database of Birds information. The student might well also add illustrations of the birds.

## **6.2 LET'S GET PRACTICAL**

It will be useful for you at this stage to see an actual *Access* database on the computer.

Make sure you have your **Work Files for Office 2010** available on your computer, then open **Access (Start > All Programs > Microsoft Office > Access 2010)**

In the **File** menu select **Open**

Access will display the **Open** dialog box (Fig. 6.2).

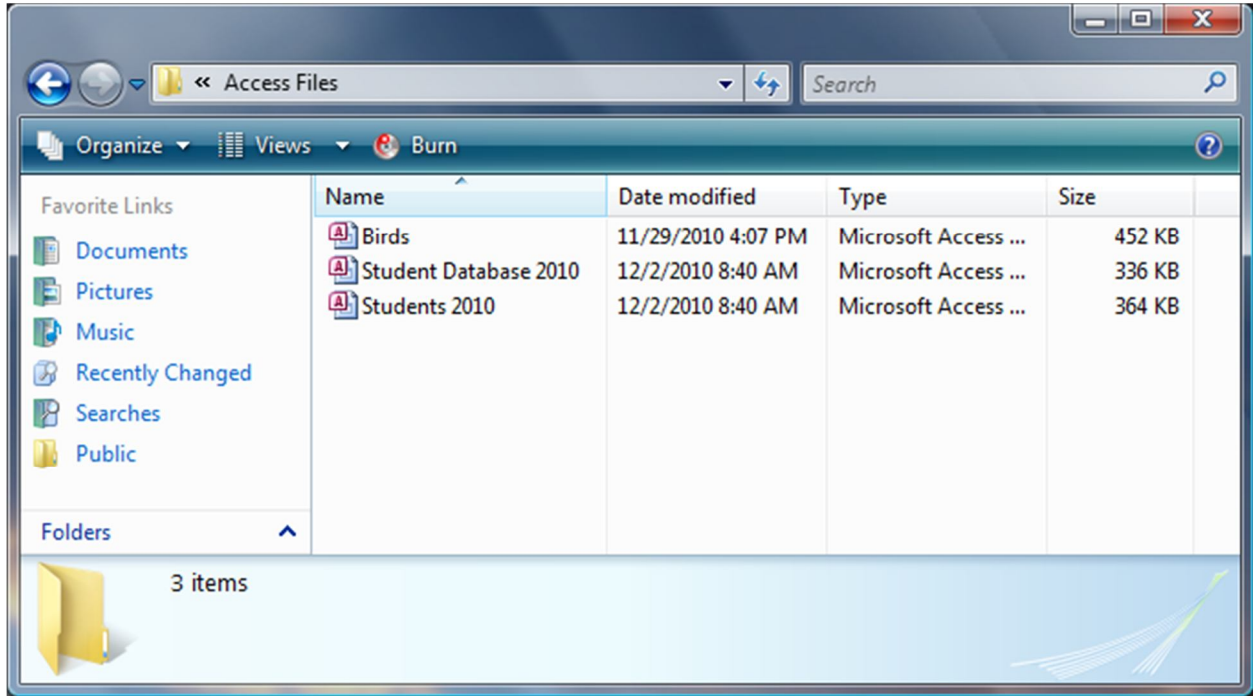


Fig. 6.2 File menu

Locate the **Work Files for Office 2010** folder on your disk and **open** it, then **open** the **Access Files** folder (Fig. 6.2 above)

The database document named **Birds** should be listed in the dialog box, so double click on it to **Open** it

Access displays a dialog box asking you to decide how you want to view the data in the database on the screen. It's likely that you'll see a Security warning there (Fig. 6.3), indicating that *"Certain content in the database has been disabled."*

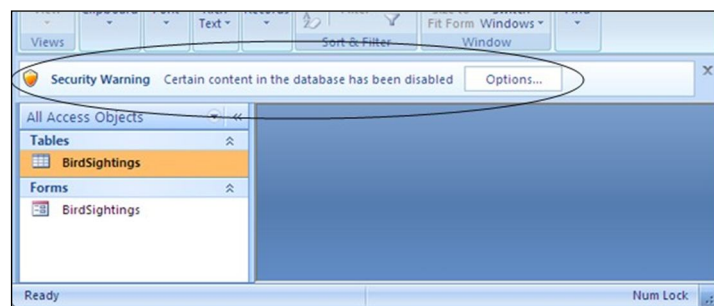


Fig. 6.3 Security warning

It's a standard security warning from Microsoft to alert you to the fact that the database does not contain a digital signature validating its authenticity. You needn't be alarmed about this with regard to the Birds database we'll be working with, but it is good for you to know that Microsoft

is watching out for you to protect your computer from infiltration by viruses and so forth. You can remove that warning for now.

Next to the **Security warning**, click on the **Options...** button, then click in the radio button next to **Enable this content** and click on **OK**

Each of the Access Objects listed in the menu on the left side of the database window (Fig. 6.4) represents one of the possible ways to view the data in the *Birds* database.

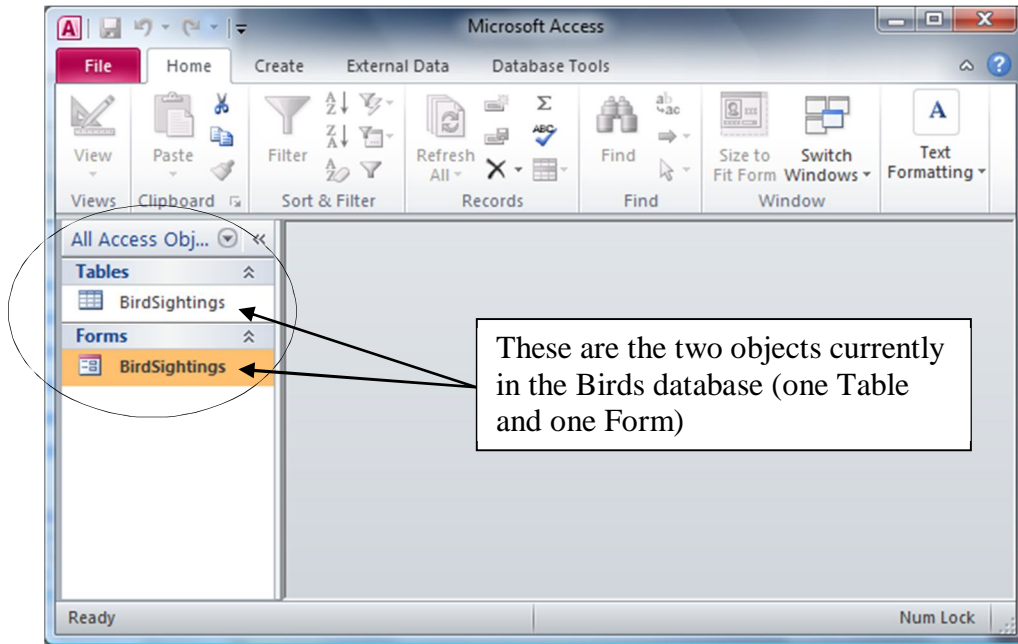


Fig. 6.4 How do you want to view the data in the database?

You can view the data as a *form*, record by record, as illustrated in Fig. 6.5.

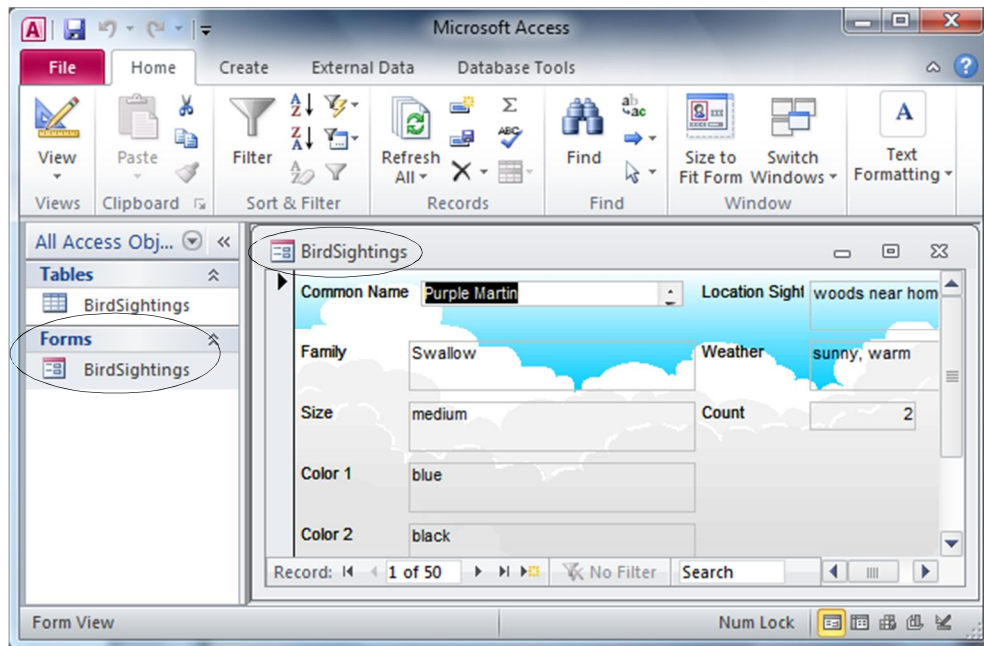


Fig. 6.5 The Form View of the database



This *Forms* view lets you review the records one by one. You use the tools in the lower left corner of the Forms window to toggle from one record to another in the database. On the other hand, you can view the data as a Table, where the data for all the records in the database are displayed in columns or as a list (Fig. 6.6).

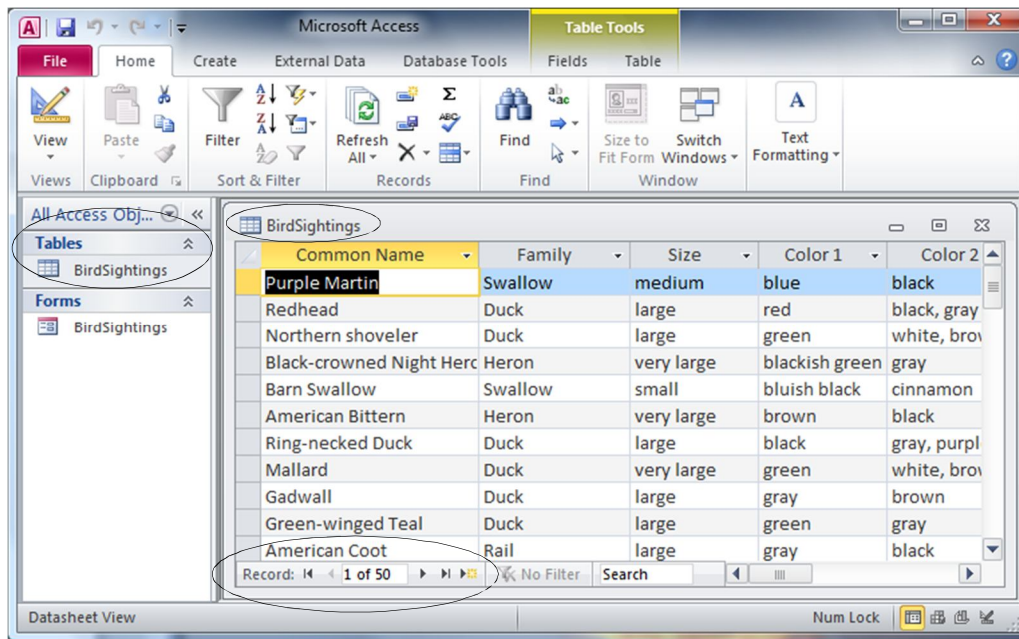


Fig. 6.6 Records listed in Table View

Let's use the *Table* view now to look at different sets of data in the *Birds* database.

If you didn't already do so, **double click** on the **BirdSightings** table listed in the **Tables Objects** in the **left frame** of the *Birds* database window (see Fig. 6.6 above)

In the upper left corner of the Table or Form's window, in the window's Title bar, you see the Table or Form name—BirdSightings (Fig. 6.6 above). In the lower left area of the Form and Table window are tools to toggle through and access specific records in the database.

Fig. 6.7 illustrates what each of these navigation tools does (Fig. 6.6 above).

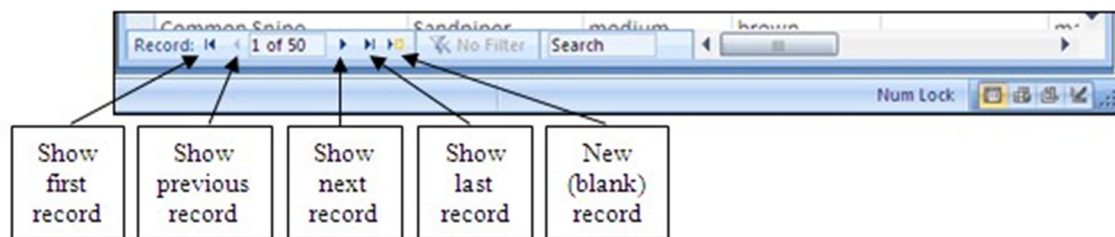


Fig. 6.7 Navigation tools in the Access database

There are 50 records in the *Birds* database. The field names (Common Name, Family, Size, etc.) are at the top of each column of data. As you can see, the screen is not big enough to allow you simultaneously to see all the records in the database. If you want to scroll through the records or look at any specific record, you have several options.

You can use the scroll bar on the right of the screen to scroll through the records.

### Try this now

To move *one by one* through the records, you can click left or right on the arrows in the navigation tools in the lower left corner of the window.

### Try this now

To go directly to a specific record, you can select the number of the record you want to view by typing the number of that record in the small data entry box between the arrows (Fig. 6.7).

### Try this now to select record 12

In the Home Ribbon, you can use *Go To* tool in the Find Group and go to either the First, Previous, Next, or Last record, or you can opt to create a New record.

### Try this now

## 6.3 PLANNING A NEW DATABASE

So much for the nuts and bolts of databases. You are now ready to get your feet wet planning your own database of student records.

Click on the **File menu** and select **Close Database** to close the **Birds** database, then click on the **File menu** again and click on the **Exit** button at the **bottom** of the pop up **File menu**

It will be good for you to start from scratch for the next database exercise. Before you develop a new *Access* database, you need to have made up your mind where you are going to save the new database (which disk drive are you going to use—your hard disk drive or an external drive such as a USB Flash drive or Thumb drive, for example. Make sure you know where you are going to save the new database before you proceed. If you are completing this exercise in a computer lab at your school, your instructor will advise you what to do.

There are three rules of database design:

Rule 1—Plan; Rule 2—Plan; Rule 3—Plan!

The more complex the data, the more you need to plan. But even the simplest database should be thought through on paper before being created in *Access*. Poor planning often results in a database that fails to meet longer term, overlooked needs.

So think about your database ahead of time—and PLAN!!

### Points to ponder when planning a database

The rule of thumb that should guide you, when planning a database, is that it becomes increasingly difficult to make changes the further along you go in the process of building a new database. If you think about it, this is true of anything you create.

Here, then, are some words of wisdom that you should bear in mind when designing a database.

### *Taking your time up front saves time later on*

The database you create will have a long, useful life if you take time to plan it carefully. After you have decided on the fields to include with each record, and *before* you create the database, you should still invest time designing layouts for reports. Thinking about reports will cause you to think about what data you plan to put in the database.

### *Teamwork helps*

During the planning stage, run your ideas by others who are familiar with the kind of database you have in mind. Network among your friends. Tell them what you have in mind. Ask them to review your design. You'll be surprised how many valuable ideas they'll come up with that may have escaped you if you had relied on your own resources. Another good idea is to involve your students in the design. This will help them learn skills that will benefit them throughout their lives.

### *Keep fields simple*

The more "atomic" your fields the more flexible will be your database. Atomic here means "reduced to its simplest form." For example, in a database of names and addresses, you would keep each part of the person's name as a separate field. The first name should be stored by itself; the same for the middle name and last name. That way you can sort the names by first or last name. You can print a listing last name first or first name last, with or without the middle name, and so on. You will have choices. Lumping the whole name under one field limits your options.

### **Design guidelines for a Student Roster database**

You have to build a database for a Student Roster. Let us say that your planning has helped you decide the following about the database and its use:

- The database will be accessible to, and managed by, your students. Each of them will enter their own data at the beginning of the year. You will advise them that they are *not* obliged to fill out every field--that it is OK to leave entries blank. Privacy is an important issue to which our students need to be sensitized. We need to take every opportunity to teach them that they should exercise control over data about themselves. They must make decisions about what is, and is not, privileged information. In a world where, inevitably and increasingly, personal data will be available to whomever wants to use it, our students must learn early on in their lives that they have a responsibility to keep tabs on that data so as to ensure, as far as is humanly possible, that they are correct at all times. Managing their own records on the class database will give them valuable experience in dealing with issues of privacy.
- You have drawn up a list of fields (illustrated later in Table 6.1) for each record in the database. Don't start entering them in yet; you still have a couple of things to get clear at this planning stage.
- All the fields will be treated as simple text, except the Date of Birth field, which will be of Date type, and the Brothers and Sisters fields, which will be of Number type. When you declare a field as Date type you can later sort the records in the database chronologically, which has its uses. Likewise, if you declare fields as a Number type you can later sort them numerically. You can also manipulate numeric data mathematically, creating totals, averages, and so forth.
- In your class you will designate one student per week as the database manager. A schedule will be drawn up for this purpose at the beginning of the year. As far as possible, any interaction with the database, including the teacher's interaction, will be monitored by that student unless this is inappropriate for reasons of privacy. Other students may use the database only when the student manager is present.
- The database manager will check the database for items of interest (birthdays, etc.) for the week he or she is in charge, and will interact with the rest of the class to decide how to recognize such items of interest.



- The last activity on the database at the end of each week will be the process of making a backup of the database. This will be necessary because changes to data can occur at any time (a student has a new brother or sister, for example). This would be done by the student database manager under the teacher's supervision.

You could add other features in an actual working environment. With all this in mind, you are ready to create the database which will hold your student records.

## 6.4 SOME HINTS BEFORE CREATING THE DATABASE TEMPLATE

You are going to start a new database of Student Records. You want to save all your personal files—word processed files, presentation files, spreadsheet files, or database files in your own Data Files folder (not in the Work Files folder).

Open Access (**Start > All Programs > Microsoft Office > Access 2010**)

Click on the **File** menu and, from the menu, select **New**

Access now presents you with the *Getting Started with Microsoft Access* screen (Fig. 6.8).

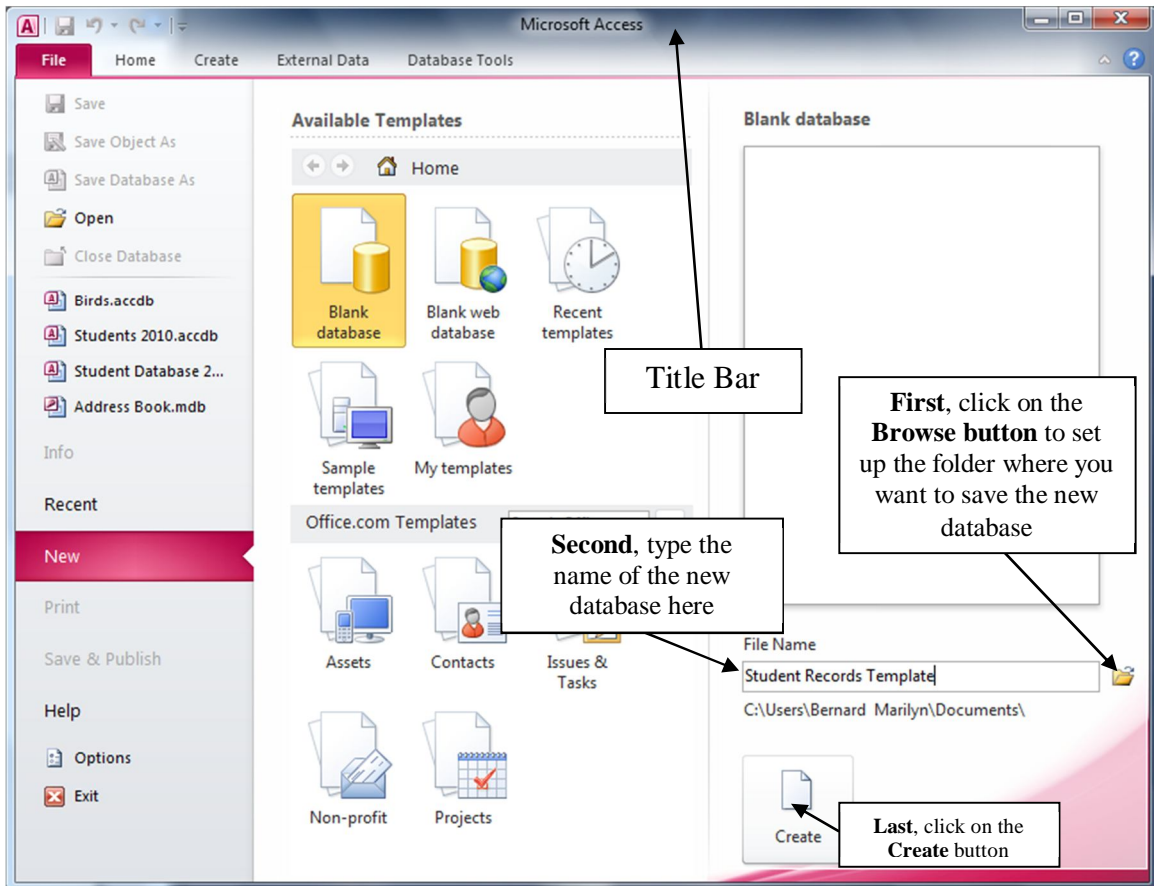


Fig. 6.8 Getting Started with Microsoft Access

Let's take a moment to check out Fig. 6.8 on the previous page. In the left-hand frame is a list of File menu options, with the New option highlighted, plus the names of any databases you may have been working with recently. In the center is a set of icons for different templates (recent

templates, sample templates, or templates you may have created yourself). Then, over on the *lower right* is the data entry box where you type the name for the new Blank Database. This is what you need to do now. But first, let's make it easier for you to see what you're doing.

**Double click** in the **Title Bar** at the **top** of the **Microsoft Access window** (see Fig. 6.8)—this will enlarge the window to the size of the complete screen

Before you type the name for the new database, you need to locate where you want to save it on your disk.

For the first step, click on the **Browse** button next to the **File Name** box (Fig. 6.8 previous page)

In the **File Name** dialog box, locate the **Work Files for Office 2010** folder and open it

Now **double click** to open the **Data Files** folder (if you do not see a **Data Files** folder there, go ahead and create it now)

Inside the Data Files folder you need to create a new folder for the databases you are going to build. You'll recall doing this in earlier lessons when you created a folder for word processed documents and then another for spreadsheets. Here are the steps to remind you how to do create a new folder for your databases.

Click on the **New Folder** icon in the **File New Database** dialog box (Fig. 6.9) and type the folder name **Databases**

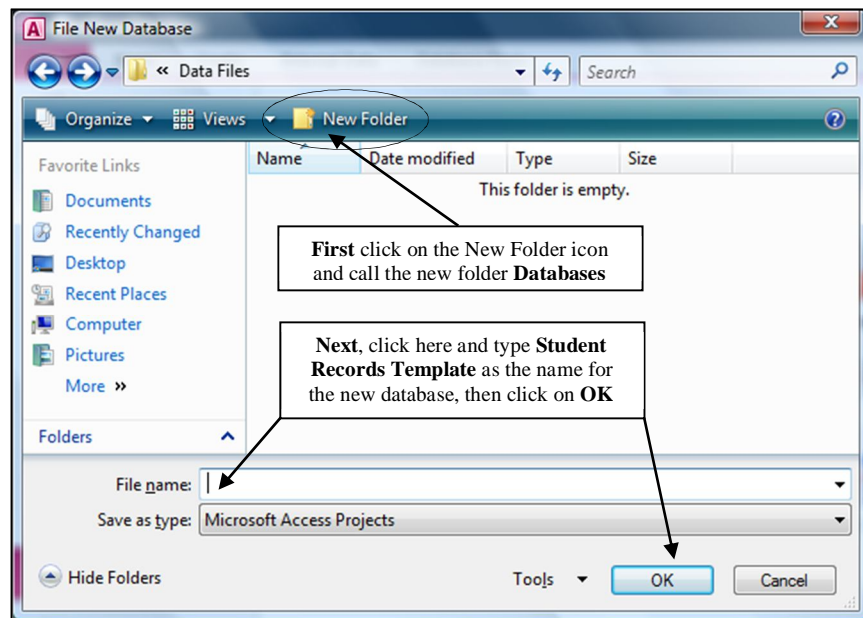


Fig. 6.9 Creating a new folder for your databases

Type **Student Records Template** as the name for the new database and click on **OK**

Now you should be back at the *Access > New database* window (Fig. 6.8 on previous page)

For the last step, click on the **Create** button in the lower right corner of the window (see again Fig. 6.8 on page 201)

Notice that the Table object is selected on the left side of the Access window. A Table is the default object in a new Access database. But first you may need to remove the Security Warning as before.

If necessary, click on the **Options...** button and click in the radio button next to **Enable this content**

Now click on the **Create** Tab to bring up the **Ribbon** for creating Templates, Tables, Queries, Forms, Reports and other database items (Fig. 6.10)

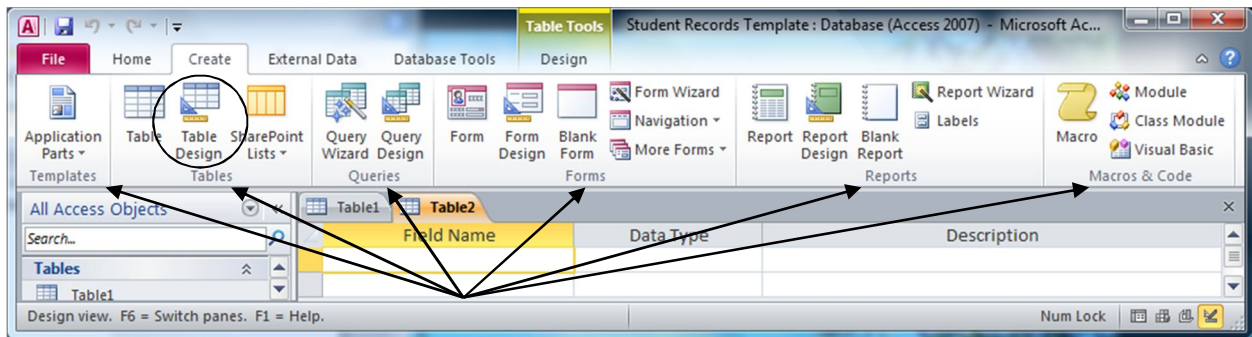


Fig. 6.10 Create Tab and Ribbon showing the Groups of tools for creating database objects

In the **Tables** group, click on **Table Design**

You will now see the Table's Design View dialog box (Fig. 6.11).

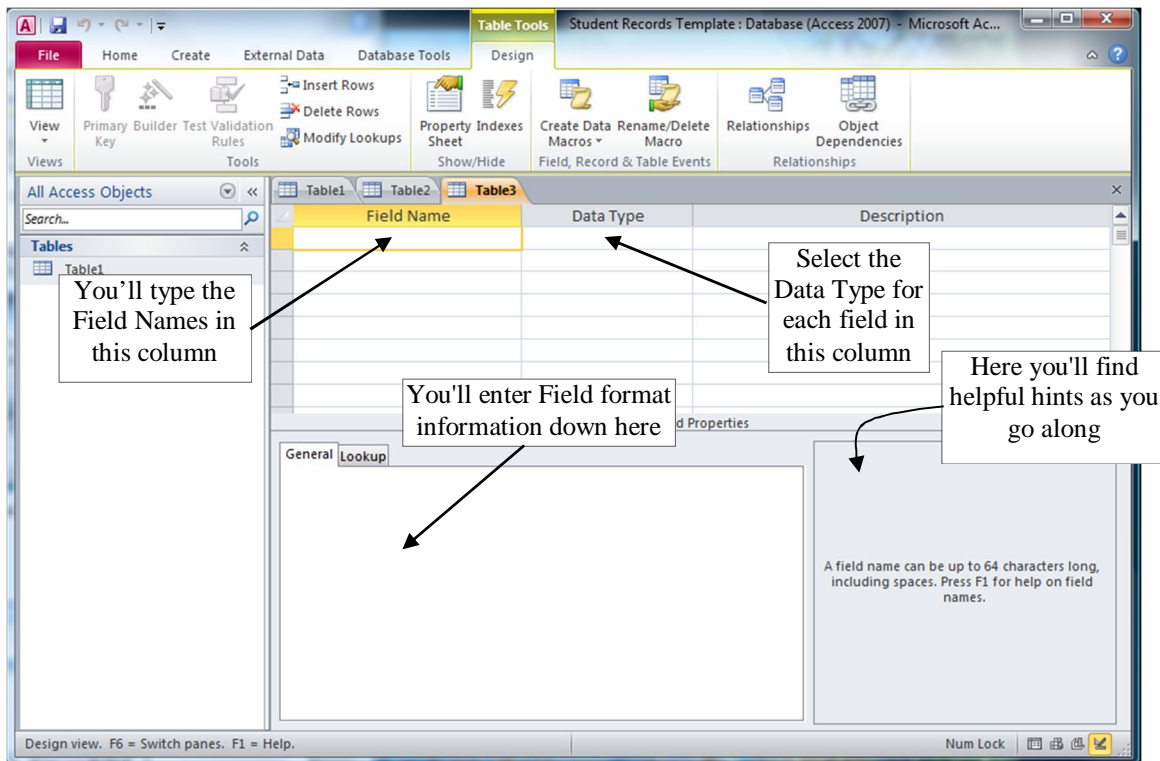


Fig. 6.11 The Table Design View dialog box

On the screen, *Access* is waiting for you to begin typing in the field names. The cursor is located in the first data entry box in the *Field Name* column, prompting you to type in a name for your first field. *Access* field names can be up to 64 characters in length, by the way, more than enough for any purposes. Before you enter the field names, however, read what follows.

**Editing field names** Table 6.1 on the next page provides you the complete list of all the field names for this Students Records database. You also can easily change, add or delete fields.

**Selecting the data type of a field** As illustrated in Fig. 6.12 above, after typing in the field name in the first column, you'll need to decide what the field's data type should be in the second column. Table 6.1 below has all this information, too.

**Setting up predefined entries for a field** To reduce the likelihood of bad data getting into the database, you can limit the user's choices when they enter the data for a particular field. For example, when they enter the Gender, you can limit the choices to M or F. In the database you're building for this tutorial, you'll be pre-defining the City and State fields as well. The tutorial will explain how to do this as you go along.

## 6.5 CREATING THE DATABASE TEMPLATE

### Entering field names for the database

Table 6.1 contains the complete list of field names for the Student Roster database. You'll be referring to this Table frequently as you work your way through the next several pages, so you might like to mark this page so you can find it easily when you need to.

Type only the Field Names that appear below in the first column of Table 6.1. The second column tells you what Data Type to choose. The other columns in the table below (Required, Length and Comments columns) are there to help you as you enter each field name and data type and explain whether data is to be "Required" for that field and what size (in text characters) the field is allowed to be, along with tips on what to do. The idea here is to help the eventual users of the database when they come to enter student data into the fields.

Field Name	Data Type	Required	Length	Comments
First Name	Text	Yes	10	
Middle Name	Text	Yes	10	
Last Name	Text	Yes	15	
Home Contact	Text	Yes	20	
Nick Name	Text	No	10	
Gender	Text	Yes	1	Use Lookup Wizard to predefine data
Address Line 1	Text	Yes	50	
City	Text	Yes	25	Use Lookup Wizard to predefine data
State	Text	Yes	2	Use Lookup Wizard to predefine data
Zip	Text	Yes	-	Use input mask to specify the format
Phone Number	Text	No	-	Use input mask to specify the format
Date of Birth	Text	Yes	-	Use input mask (Short Date) format
Brothers	Number	No	-	Long Integer
Sisters	Number	No	-	Long Integer
Place in Family	Number	No	-	Long Integer
Clubs	Memo	No	200	
Hobbies	Memo	No	200	
Favorite Sports	Memo	No	200	
Favorite Subjects	Memo	No	200	

Table 6.1 Template Field Name listing

In the **first** data entry box in the **Field Name** column, type **First Name** for the field name and hit the **Tab** key to move the cursor over to the **Data Type** column

Notice, in the lower right section of the window, that *Access* provides help to guide you as you enter the data for each part of each field. Read this help as you go along. In the lower left section of the window you can see the *Field Properties* dialog box (Fig. 6.12).

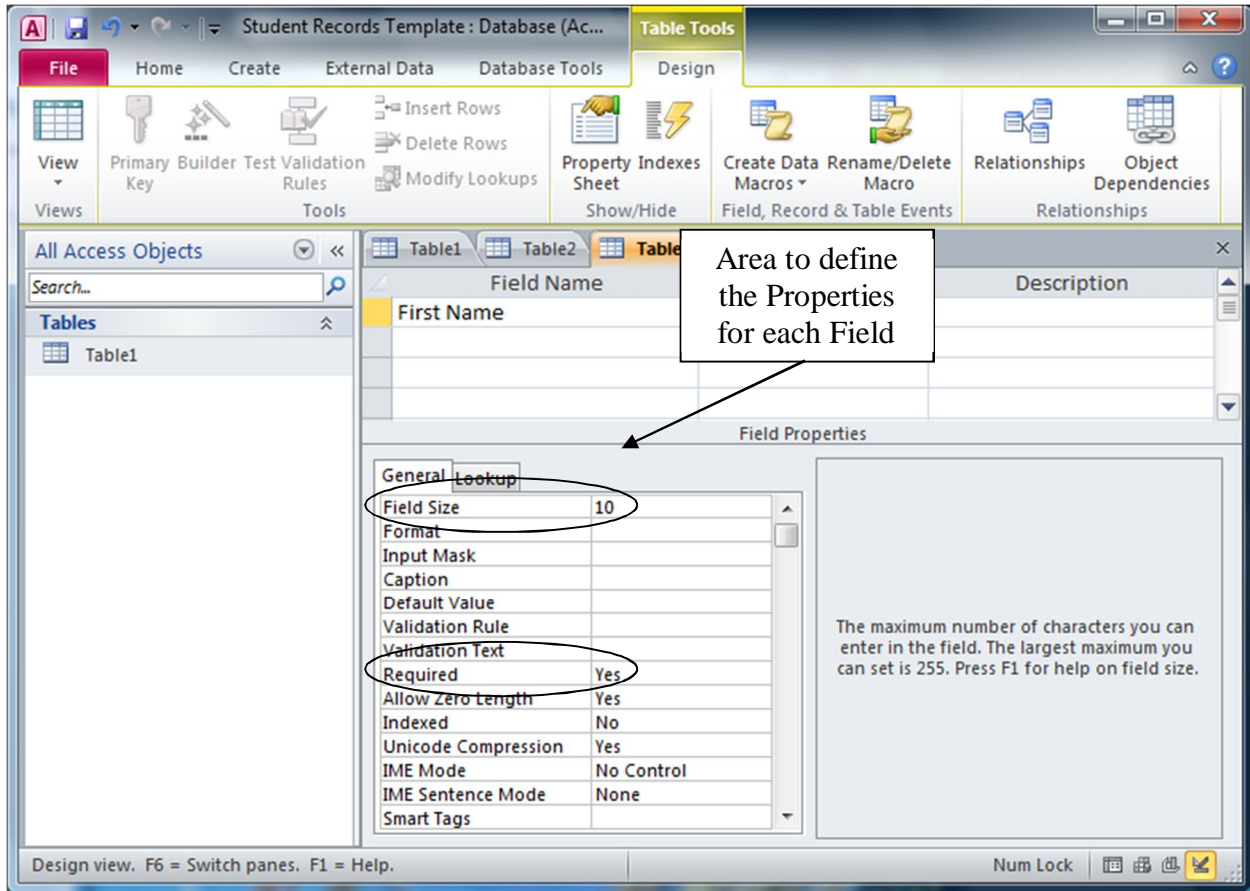


Fig. 6.12 The Field Properties dialog box

If you take a look at what it says in Table 6.1 on the previous page, the *Length* column specifies the number of characters required for several of the fields in your database.

Check Table 6.1 on the previous page to find out the **correct size** for the **First Name** field

Now, look down at the **lower left corner** of the Access Design window (Fig. 6.12), where you can see a list of **Field Properties**, along with data entry boxes to specify **Field Size**, **Format**, and so forth

In the **Field Size** box type **10** (so as to allow up to 10 characters for the **First Name**)

For the First Name field, and for several other fields (again check out Table 6.1) you want the user to *definitely* fill in an entry—in other words, an entry is *required*. You don't want the field left blank. Here's how you can ensure that this happens in your database.

In the **Field Properties** area (Fig. 6.12 on previous page), **double click** in the data entry box next to **Required** in order to toggle (switch) the entry from **No** to **Yes**

Since you need a First Name, you don't want it to be zero length so, in the **Field Properties** area, make sure the **Allow Zero Length** entry is set to **No**

Now go back up and click in the **next Field Name box** (below the **First Name** box) so you can enter the next database field name

Enter the field names **Middle Name** (10 characters), **Last Name** (15 characters), **Home Contact** (20 characters), in each case making sure you have **Yes** in the **Required** Field Property and **No** in the **Allow Zero Length** Field Property for each of these fields

Now enter the field name **Nick Name** (10 characters), but leave **No** in the **Required** Field Property box, since a Nick Name is **optional**

Before naming the rest of the fields in the database, click on the **File menu** and select **Save Object As**, then, in the dialog box that pops up asking you to give this new table a name, type the name **Student Records Table**

When, as now, you attempt to save the table for the first time, you are asked to define a *Primary Key* for the Table. So what is a Primary Key in a database? The purpose of a Primary Key is to enable easy manipulation of the data across multiple tables. If, for example, you were designing a database for an administrative application in the Principal's or Superintendent's office, or for a sizable company, this would be an important consideration, because your database would be large, and there would be many ways of looking at the data in the database (called "views" on the data) represented by different tables. However, this is not something the class teacher needs to worry about, so you won't need a Primary Key for the table you are about to save.

Click on **No** to tell Access you do not want a Primary Key field in the database

You'll notice that Access now lists the Student Records Table as one of the objects in the left hand frame of the database window.

### **Using the Lookup Wizard to specify selected values for a field**

For the database fields Gender, City, and State (see Table 6.1 on page 204), the values that should be entered are predictable. For the Gender, it will be M or F, for example. For the City, it will be a couple of the towns or cities where your students live. For the State, it will be the abbreviation for the state in which your students live.

The next series of steps show you how to specify pre-selected values such as this for a field.

In the next **Field Name** box, enter the field name **Gender** and hit **Tab**

Now click on the **down arrow** in the **Data Type** column and select **Lookup Wizard...** in the drop down list

In the **Lookup Wizard** dialog box (Fig. 6.13 on next page) click on the **radio button** next to "I will type in the values that I want", then click on **Next >**



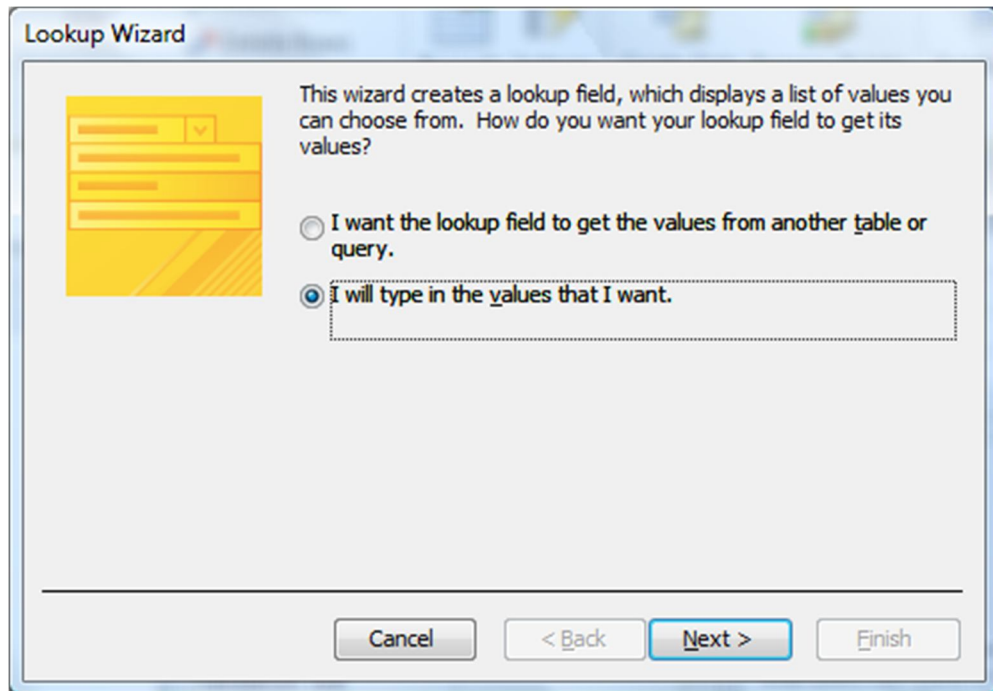


Fig. 6.13 Opting to enter the values yourself

In the next Lookup Wizard dialog box (Fig. 6.14), leave the default **1** for the **number of columns**, hit **Tab** (or click in the data entry box under **Col 1**) and type **M** (for Male)

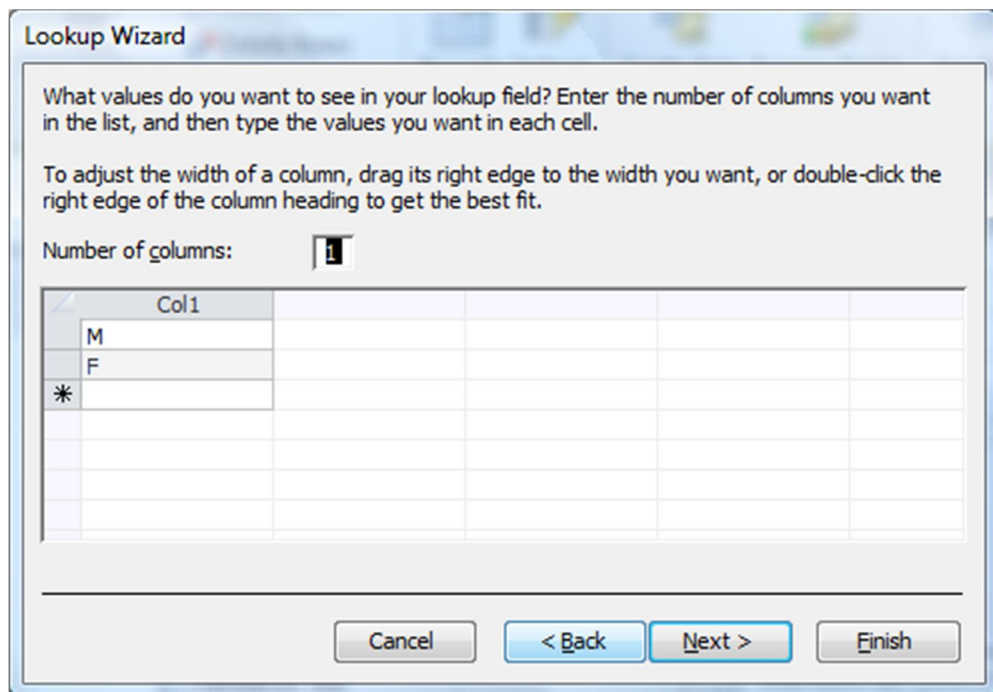


Fig. 6.14 Entering the values for the Gender field

Hit **Tab** or click in the next data entry box in the **Col 1** column, and type **F** (for Female), then click on **Next >** to go to the next step in the Wizard

There's no need to change the label for the Lookup column (**Gender**), so click on **Finish** in the dialog box

Go back up to the Field Name column and click in the data entry box under **Gender**, type the field name **Address Line 1**, hit **Tab**, in the **Field Properties** area type **50** for the **Field Size** and make it a **Required** field

Now you need to use the Lookup Wizard to define a set of data if your students all come from the same one or two towns, a likely scenario in any school district. If you teach in a public school in the US, your students also will all live in the same State. So for the City and State fields you'll use the same steps as you did to create the Gender field.

Click under **Address Line 1**, type the field name **City**, hit **Tab**, select **Lookup Wizard...** for the **Data Type** and follow the same steps as you did for the Gender field to enter the names of a couple of local cities or towns—you decide

Create the **State** field with the **Lookup Wizard** Data Type, too, and enter the initials for your state as the value for the list

You will see later that the city or cities you name, along with the State, automatically will appear as selections when entering data into those fields in the database.

### Using an input mask to control the format for a field

You want to make sure that certain fields have a consistent format, such as zip codes or phone numbers, for example. You can have Access help you control the way the user enters data for such fields by using an *input mask*, which forces the user to enter the data a certain way. This reduces the likelihood of incorrect data getting into the database.

Let's see how this works with the Zip code field, which is next in the list of Field Names (see again Table 6.1 on page 204).

In the list of field names, click in the entry area under **State**, type the field name **Zip Code**, then hit **Tab**

For the Zip Code, it's a good idea to use a Field Property *Input Mask* to help the user enter the zip code in the correct format.

In the **lower left section** of the Design window, in the **Field Properties** area, click in the **Input Mask** data entry line—noticed that this brings up **ellipses (...)** at the end of the data entry line (Fig. 6.15)

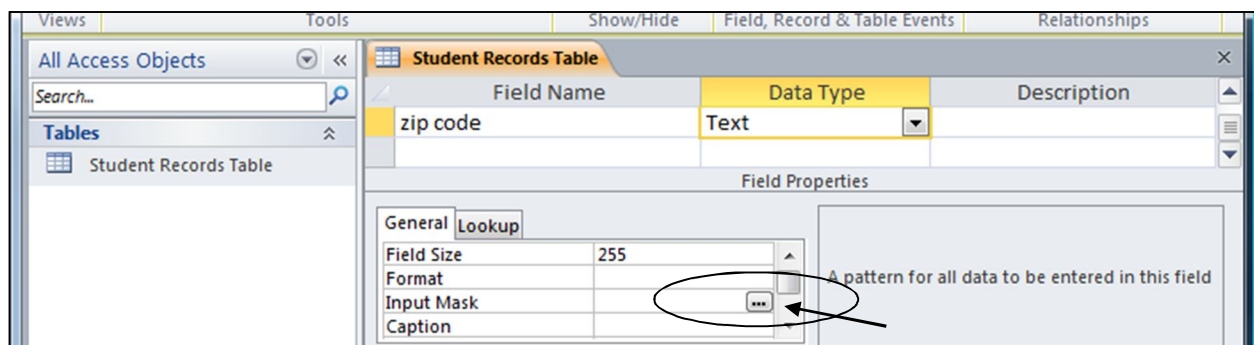


Fig. 6.15 When you click in the Input Mask box Ellipses appear at the end of the data entry line

Now click on the **ellipses (...)** that pop up at the **right** end of the data entry line

Access will prompt you to **Save** the table at this point so that you do not lose the work that you have completed, so click **Yes** to **Save the Table**, then click on **OK**

Now click on the **Zip Code input mask** in the **Input Mask Wizard** dialog box (Fig. 6.16)

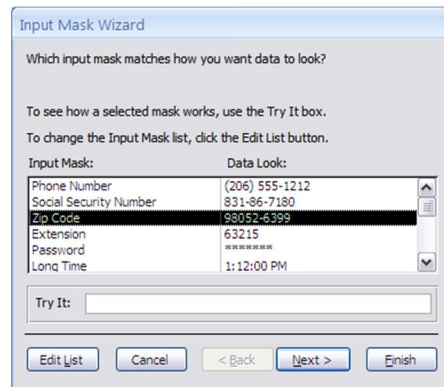


Fig. 6.16 Zip Code input mask

To see how the mask works, click in the **Try it** box—try entering a zip code with **more than 9 digits** (the system will **beep** if you try to do so, thus showing you the purpose of the input mask, which is to help users enter data **correctly** when they fill out a student record)

Click on **Next >** to proceed to the next step in the Wizard

The Wizard now asks you in a new dialog box (Fig. 6.17) if you want to change the input mask for the Zip Code and if you want to select a placeholder character which will help the user when they enter zip codes into the database.



Fig. 6.17 Option to change Zip Code input mask

The **underline** character is the default, as you can see, so accept it as the **placeholder** character for the **Zip Code** field, then click on **Next >** to proceed to the next step in the Wizard

In this last step in the Input Mask Wizard, click in the **radio button** to select **With the symbols in the mask, like this:** (Fig. 6.18), then click on **Finish**

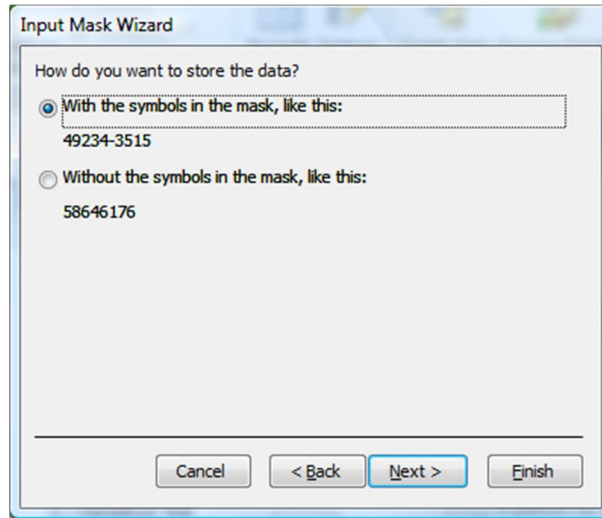


Fig. 6.18 You want to keep the symbol in the mask when you save the data

*Practice makes perfect*

You next need to follow the same steps to use an input mask for the Phone Number field. Remember to select **Text** as the data type for the **Phone Number**. If it is entered as Number type it will be treated as math (numeric) and the hyphen will act as a math operator. In any case, *you can only use an input mask with Text or Date/Time data types.*

Type the field name **Phone Number** then click in the **Input mask** Field Properties data entry box

Now click on the **ellipses (...)** that pop up at the end of the data entry box and click on **Yes** to **Save** the Table when Access prompts you to do so, then click on **OK**

Next click on the **Phone Number input mask** in the **Input Mask Wizard** dialog box and click on **Try it** to see how the mask will look

The Wizard again asks you in a new dialog box if you want to change the input mask for the Phone Number and if you want to select a placeholder character which will guide the user when they eventually enter phone numbers into the database.

Click on the **underline** character as you did for the Zip Code to select it as the placeholder character for the **Phone Number** field

Click on **Next >** to proceed to the next step in the Wizard, then click in the **radio button** to select **With the symbols in the mask, like this:**

Click on **Next >** to proceed to the next step in the Wizard, and click on **Finish**

For the Date of Birth field, which is next in the listing in Table 6.1 on page 204, you want to select *Short Date* as the data type for the field, and apply an input mask to the entry for it, too.

Follow the same steps as you just did for the Zip Code and Phone Number fields, except this time select the **Short Date** input mask in the **Input Mask Wizard** dialog box

The remaining fields in the database (Clubs, Hobbies, Favorite Sports, and Favorite Subjects) will all be *Memo* data type to allow the user to type a longer entry if desired.

When you have completed the entries for **all 19 field names**, **right click** on the **Student Records Table tab** (Fig. 6.19) and click on **Save** in the pop up context menu

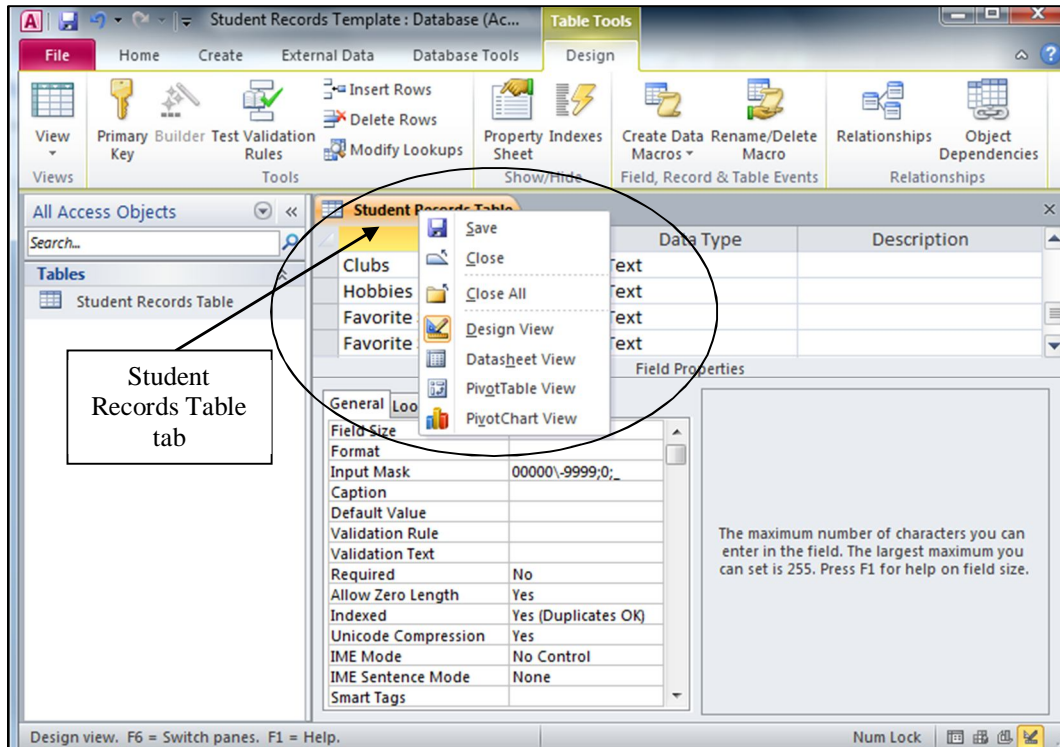


Fig. 6.19 The Student Records Table tab

## 6.6 COMPLETING PREPARATION OF THE DATABASE TEMPLATE

### Creating a Form for the new database

The following exercises will help you learn how to prepare a database Form.

A Form is a database object which allows you to view the data one record at a time, unlike a Table where you can view the data as a continuous list of records—recall how the Table looked in the Birds database you checked out at the beginning of this tutorial. A Form is a convenient tool for data entry purposes because it allows the user to see all the Field entries in a single record at one time, unlike the Table view (the Datasheet View) which will often be unable to show all the data fields of a single record across the screen. Let's create a Form now.

Click on the **Create** tab to show the **Create Ribbon** at the top of the window and, in the **Forms** group, click on the **Form Wizard** tool (Fig. 6.20)

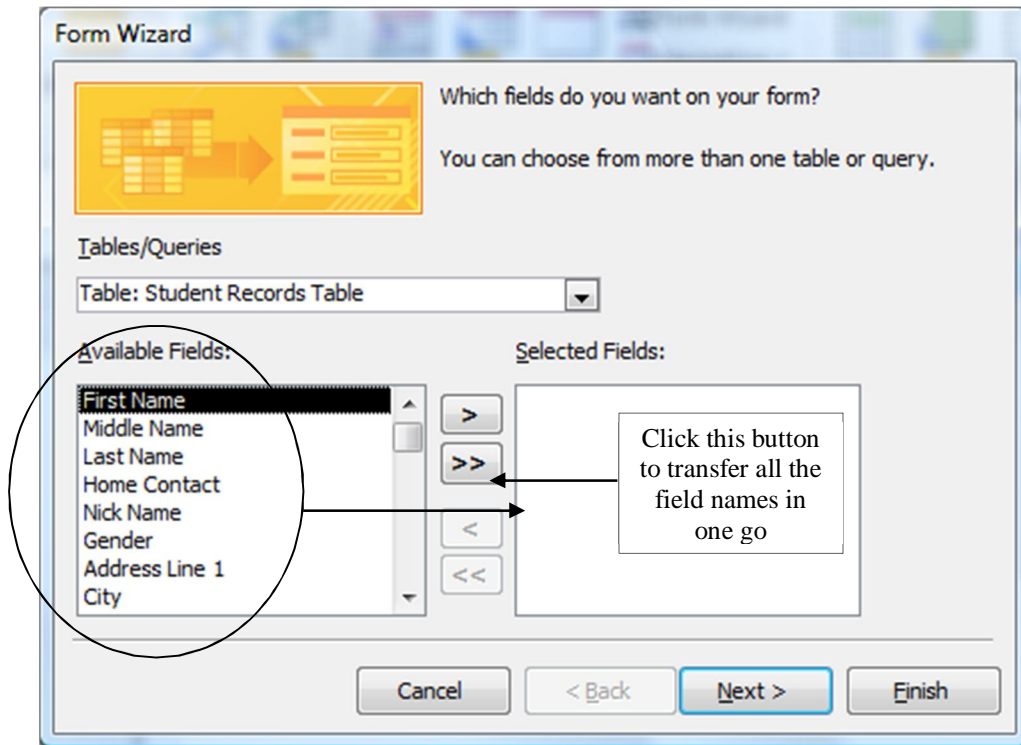


Fig. 6.20 The Form Wizard tool in the Forms group of the Create Ribbon

The Wizard will help you design the Form based on the fields and data types (including input masks) you have selected. You'll begin by telling *Access* to include all the *Available Fields* for the Form.

**Click** on the **double arrow icon** (Fig. 6.20) in order to transfer all **19 Fields** across to the **Selected Fields:** scroll box, then click on **Next >**

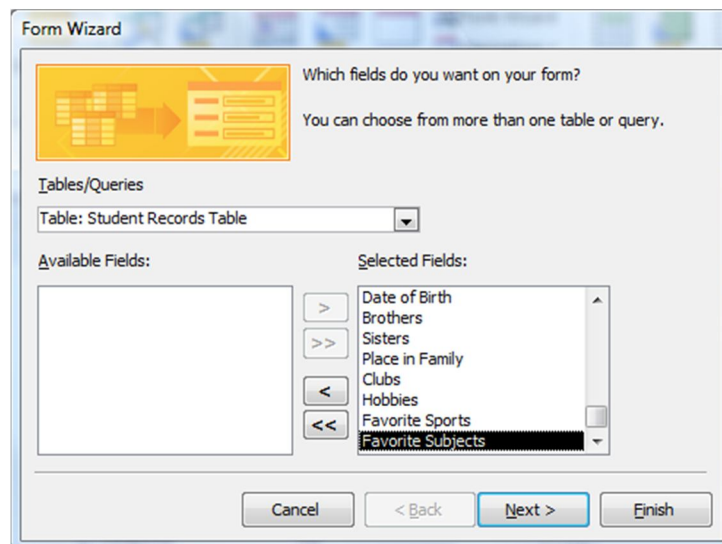


Fig. 6.21 All the Available Fields have been transferred to the Selected Fields box  
The Form Wizard now asks what layout you want for the new Form (Fig. 6.22).



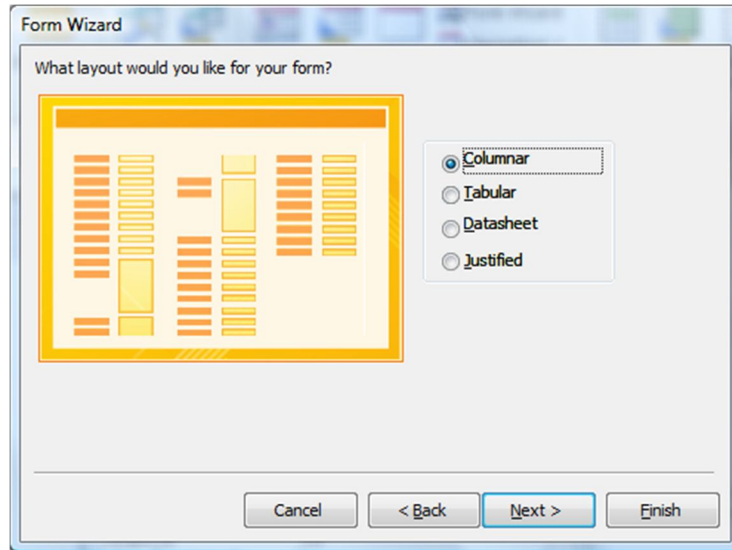


Fig. 6.22 The Form Wizard layout options dialog box

Columnar layout will work well for our purposes, and that is the default. But check out the sample layouts while you are here by clicking on each of the radio buttons.

End up with the **Columnar** radio button selected, then click on **Next >** again

In the next dialog box, the Wizard asks you to name the new Form and also whether you want to modify the design in any way (Fig. 6.23).

Type the name **Student Records Form** and make sure the **radio button** next to **Open the form to view or enter information.** is selected, then click on **Finish**

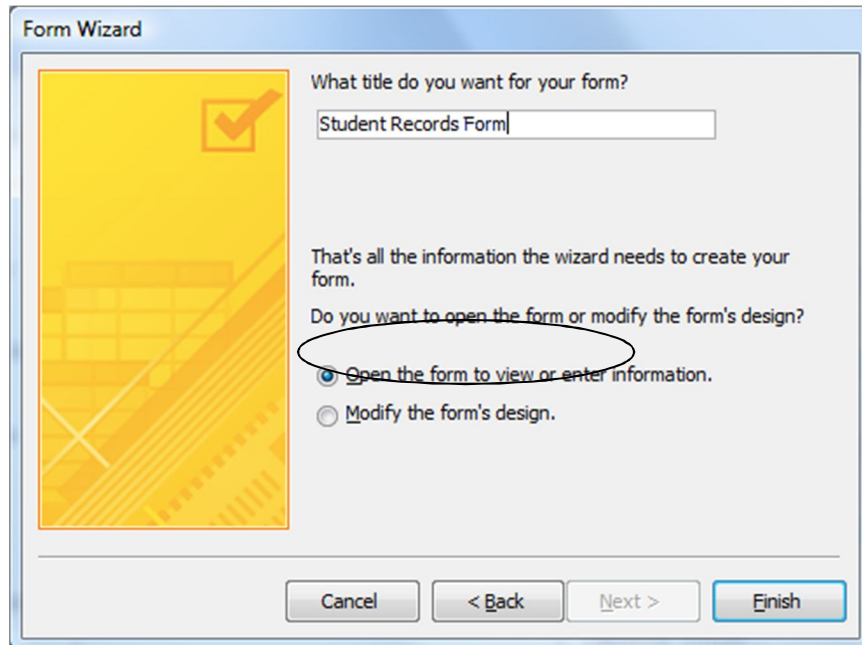


Fig. 6.23 Option to name and modify the form

Access now displays the Wizard's default layout for the Form (Fig. 6.24).

The screenshot displays the Microsoft Access application window titled 'Student Records Template: Database (Access 2007) - Microsoft Access'. The ribbon at the top is set to 'Database Tools', which includes sections for 'Filter' (with options like Ascending, Descending, Advanced, Remove Sort, Toggle Filter), 'Records' (with options like New, Save, Delete, Refresh, Totals, Spelling, More), and 'Find' (with options like Replace, Go To, Select). The left-hand 'Navigation' pane shows 'All Access Objects' with 'Tables' and 'Forms' sections. The 'Forms' section lists 'Student Records Form'. The main window area displays the 'Student Records Form' in 'Form View'. The form has a title bar 'Student Records Form' and contains two columns of text boxes. The left column includes fields for First Name, Middle Name, Last Name, Home Contact, Nick Name, Gender, Address Line 1, City, State, zip, Phone Number, and Date of Birth. The right column includes fields for Brothers, Sisters, Place in Family, Clubs, Hobbies, Favorite Sports, and Favorite Subject. The status bar at the bottom indicates 'Form View', 'Record: 1 of 1', 'No Filter', 'Search', and 'Num Lock'.

Fig. 6.24 The new form in Form View

If you wanted to, you could make changes to the layout of the Form you see on the screen. But the default layout is fine in this case, so we'll leave well alone for now. Later, in Lesson 7, you will learn how to make layout changes like this when you create new reports.

**Right click** on the **Student Records Form** tab (see Fig. 6.24 above) and click on **Save** in the pop up context menu

This is where all your hard work pays off. You should see the new form on your screen, and it should look something like Fig. 6.24. You can now go ahead and start adding records to the new database.

## 6.7 ADDING RECORDS TO A NEW OR EXISTING DATABASE

### Creating a new database based on the Student Records Template database

The *Access* database Student Records Template is so named because you want to use this same template document (with its table *Student Records Table*) and data entry form (*Student Records Form*) over and over for class records in the years ahead.

Before you start adding data about this year's students, you need to create a new database using this template as the model. You will use the copy of the template to store actual student data for a hypothetical class (or a real class, if you are a practicing teacher). The template will thus remain unchanged for future use as the basis for other class databases.

How you name documents is important. For the sake of this exercise, you're going to call the new database *Fall Roster 2010* (or some other appropriate name if you prefer). The name indicates that the document will contain the database of student records for a Fall 2010 class. If you are currently teaching, you can use a different name if you want to use this tutorial to build an actual database for your own class. Substitute the name you choose wherever we refer to *Fall Roster 2010* as you go along.

The Template database should still be displayed on your screen. You can have only one (1) *Access* database open at a time, so *Access* will automatically close the Template database when you start to create a new one.

In the **File** menu select **New**

In the **lower right corner** of your database window, click on the **Browse** button next to the **File Name** box (Fig. 6.25)

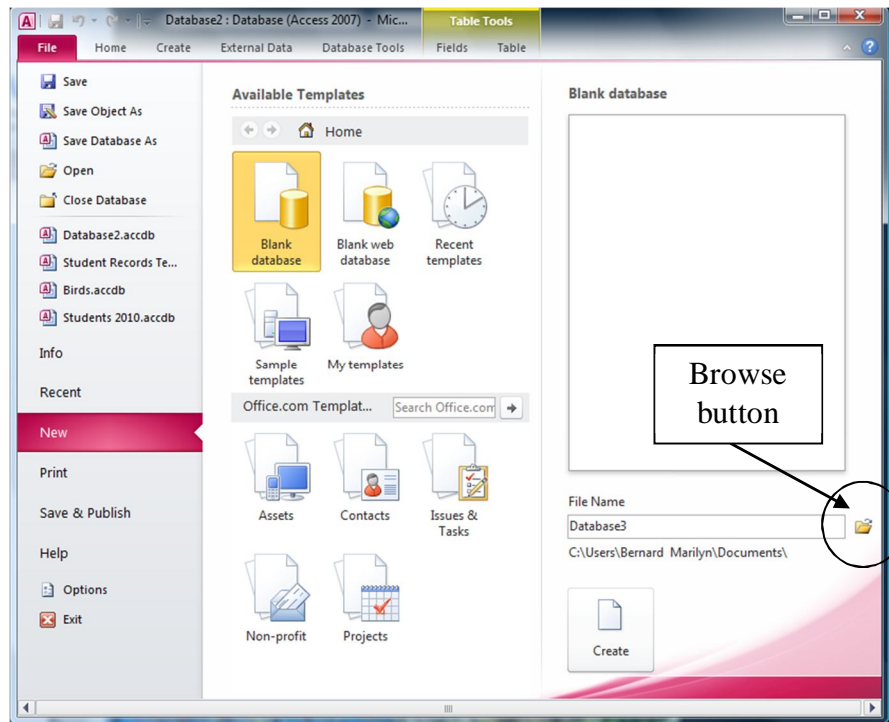


Fig. 6.25 Browse button

In the **File New Database** dialog box that pops up, locate the **Work Files for Office 2010** folder and open it

Now **double click** to open the **Data Files** folder, then open the **Databases** folder (which is where you are going to save the new Fall Roster 2010 database)

Type the new document name **Fall Roster 2010**, click **OK**, and click on the **Create** button

### Importing a Table

You are going to start by importing the table called *Student Records Table* from the *Student Records Template* database. This will save you having to recreate the table all over again for the new class of students you're going to put in the *Fall Roster 2010* database. You'll be able to use the Template over and over again for new classes in ensuing semesters or years. Notice, however, that there is a default Table called Table1 listed as an object in the left hand column of the new database window. Before importing the table from the *Student Records Template* database, you need to delete this Table1, which you can do by simply closing it.

**Right click** on the **Table1 Tab** (see Fig. 6.26) and, in the pop up menu, select **Close**

Click on the **External Data** tab to display the **External Data Ribbon** (Fig. 6.26)

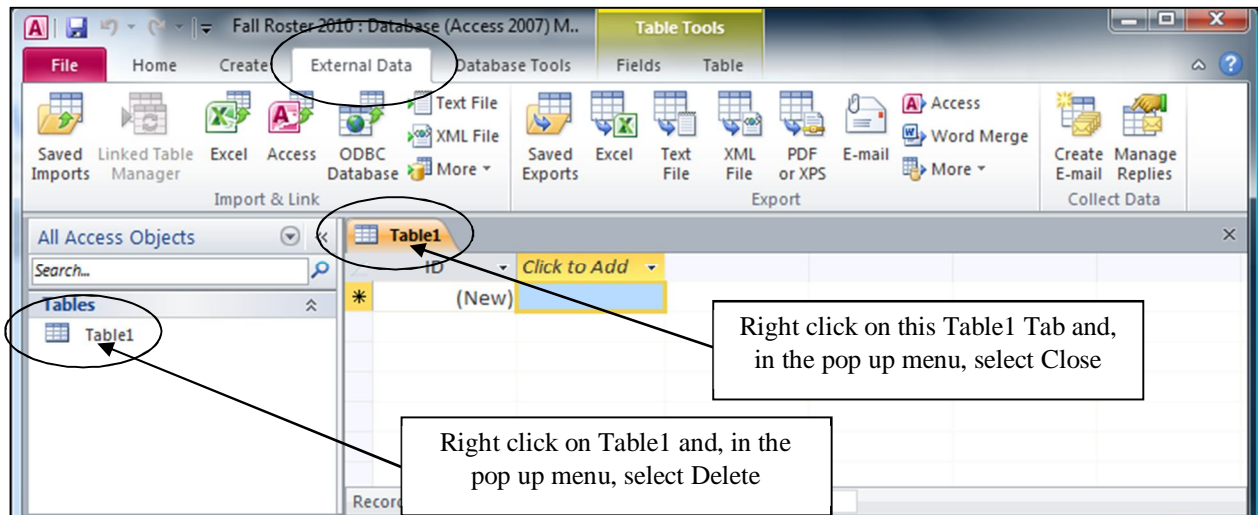


Fig. 6.26 The External Data Ribbon

Now click on the **Access icon** in the **Import & Link** group (Fig. 6.27) in order to import an existing Access database table, form, or report

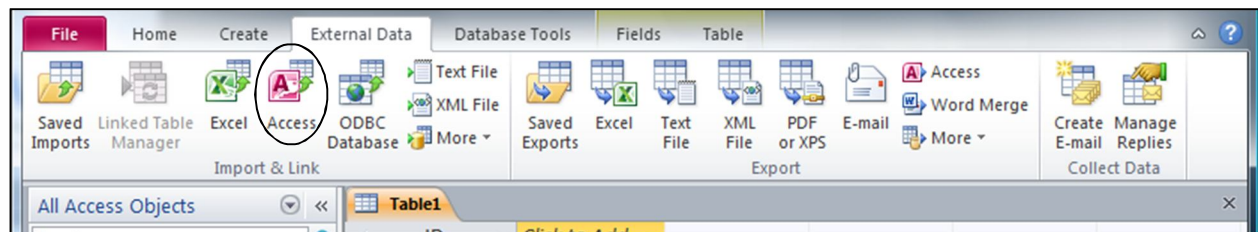


Fig. 6.27 Import an Access database from an External Data Source

In the next dialog box that pops up (**Get External Data – Access Database**), click on the **Browse** button to locate on your disk, in the **Work Files for Office 2010 > Data Files > Databases** folder, the **Student Records Template** database, then **double click** on it to **Select** it and, in the **Get External Data – Access Database** dialog box, click on **OK**

Now you should see the Import Objects dialog box (Fig. 6.28)

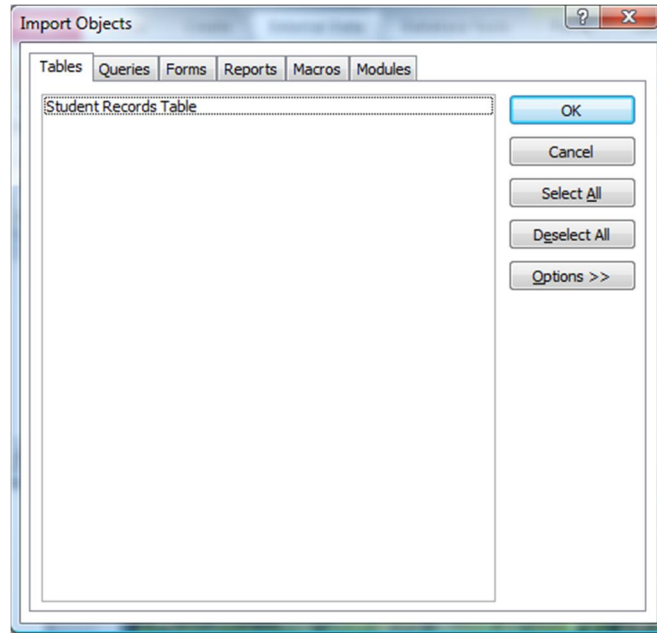


Fig. 6.28 Import Objects dialog box

In the **Import Objects** dialog box, make sure the **Tables** tab is selected, then click on the **Student Records Table** and click **OK**

No need to save the steps you just carried out, so click on **Close** to close the **Get External Data – Access Database** dialog box

The Table is imported from the *Student Records Template* into the *Fall Roster 2010* database. Now you need to import the form you created for the template database, too.

### Importing a Form

Here are the steps to import the Student Record Form from the Student Records Template database.

Once again, click on the **External Data** tab to display the **External Data Ribbon**

Click on the **Access icon** in the **Import group** (Fig. 6.27 above) in order to import an existing database table, form, or report

Click on the **Browse** button in the next dialog box and locate on your disk, in your **Data Files** folder, the **Databases** folder in which you have the **Student Records Template** database and click on **OK**

Now, once again, you should see the Import Objects dialog box (Fig. 6.28 above)

In the **Import Objects** dialog box, first click on the **Forms tab**, then click on the **Student Records Form** to select it, and click **OK**

No need to save the steps you just carried out, so click on **Close** in the next dialog box

The Form is now imported from the *Student Records Template* into the *Fall Roster 2010* database. The *Fall Roster 2010* database now has a Table and a Form identical to the table and form that you created for the *Student Records Template* database. You can add student records to the database any time you like. So if you are *not* ready to insert new records at this stage, you can close the database. If you want to start entering data now, you can proceed with the tutorial.

### Entering the data for the records in the database document

You should still have the **Fall Roster 2010** database open, so **double click** in the left hand frame on **Student Records Form** to open it

Remember that each record in the Fall Roster 2010 database is made up of the data for a full set of 19 entries for each student. If you are an in-service teacher, and you want to add the data for the students in your class, you should practice entering at least one or two records on your own. But you might then want to see how your students can handle this job. There is a lot of data for each record after all. If you have a Windows computer in your home room, and you have a copy of *Access* to use with it, get your students involved in the data entry process. They will enjoy it, and you will be able to delegate an otherwise tedious task.

If you are a student teacher, you may or may not have the opportunity to complete this exercise with a real class. Whatever the case, you will need to enter a few records at this stage (five will do nicely for now) so that you can complete the rest of this tutorial.

Begin by selecting the **First Name** field of **record #1** by clicking in the data entry box (the cursor is probably waiting there, unless you have already clicked elsewhere)

Type in the **First Name** of one of the students in your roster

The names don't have to be in any particular order since you can quickly sort them later on. Check the name you just typed. Is it correct?

If so, hit the **Tab** key to proceed to the next field (you'd press **Shift-Tab** if you wanted to move to a previous field)

Notice that the data are now stored in the data entry box for the First Name field in Record 1. If you wanted to correct the data, you would do so by clicking in the data entry box and then make any changes as if you were in the word processor.

Continue entering data for **Record 1** (the data for the first student in the roster); make up the data as you go along if you don't have actual students in mind

### Adding a New Record to the database

After you type the **last field entry** for each record, press **Tab**, and Access will automatically present a **new record Form**



*Access* will also automatically save each completed record into the database on your disk, so you don't have to worry about losing your work as you go along, and you also won't need to save the database at the end.

Type the entries into each field one by one; be sure to press the **Tab** key after each entry to get to the next field (eventually you should have **at least 5 records** in the **Fall Roster 2010** database)

Adding a record to an existing database is just the same. New records are always added at the end of the database. If you want the new record to appear in a specific place in the Datasheet view you would use the Sort function. You'll learn how to do this in Lesson 7.

The new record will always have the same layout and format characteristics as the others in the database. Also, remember that *Access* automatically saves a new record in the database after you have filled in the data for every entry.

## 6.8 VIEWING THE DATA IN THE DATABASE

Here are some of the ways to move about in a database. *Access* makes it easy for you to get around. Take a few moments to move from field to field and from record to record. Try these exercises.

Click anywhere in the **data box** next to a **field name**

This allows you to edit or add data if needed.

Hit the **Tab** key to move to the **next field** in the **same record**

To move to the **same field** in the **next** or **previous record**, click on the left or right arrows in the **Navigation tools** at the bottom of the Form window (Fig. 6.29)

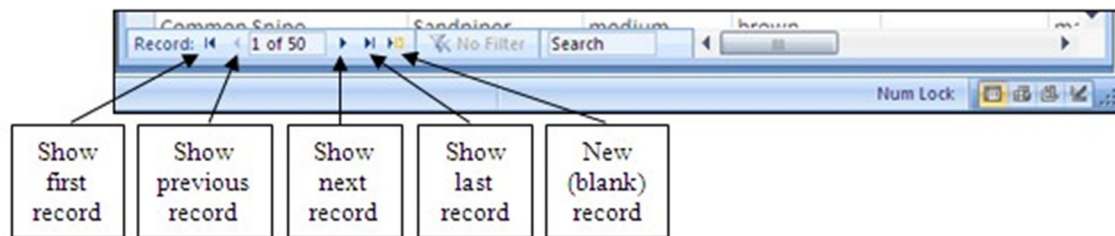


Fig. 6.29 The *Access* database navigation tools

In Lesson 7 you will learn other ways of searching through the database, along with other ways of selecting sets of records from the database, and so forth. For now, as a final exercise in Lesson 7, let's just learn how to update the data in an *Access* database.

## 6.9 UPDATING ENTRIES AND RECORDS IN THE DATABASE

The following exercises will give you the opportunity to practice working with the data in a database.

**Updating the contents of a field (one item of data in a student record)**

You should still be looking at the **Student Records Form**

To clear (delete), or otherwise change the contents of a field in a record, click on the field data entry box, then erase characters or words in the same way as you would if you were in the word processor.

### **Deleting (clearing) a record**

In order to delete a single record from a database, you would select the record that you want to remove, then, in the Home Ribbon, select Delete Record from the Delete menu in the Records Group menu, and voilà!

Try this for practice.

Click on the **second record** in the **Fall Roster 2010** database to select it

In the **Home Ribbon**, in the **Records Group**, from the **Delete menu** select **Delete Record**

*Access* will warn you that you are about to delete a record and tell you that you will not be able to undo the deletion. This gives you the opportunity to change your mind, which you can do in this case. *Access* will otherwise immediately permanently remove the record if you click on *Yes*.

Click on **No** in the dialog box

### **Deleting several records at once**

You can use the Datasheet View to clear several records that are listed next to each other. To delete several records at one time here's what you do.

You need to be in the **Datasheet View** of the database, so, in the left hand frame **double click** on **Student Records Table**

Now drag in the **left hand margin** of the Table to **highlight** any two **adjacent records** that you want to delete

In the **Home Ribbon**, in the **Records Group**, from the **Delete menu** select **Delete Record**

The database will warn you that you are about to delete however many records you have selected, and will ask you if you are sure you want to do this.

You don't, so click on **No** in the dialog box

Bear in mind that the Delete Record command completely removes a record, such that it is irretrievable.

## **6.10 SAVING A BACKUP COPY OF YOUR WORK**

Your last task before completing this session at the computer is to make a backup of your Student Records Template and Fall Roster 2010 databases on another disk. The Fall Roster 2010 database is still on the Desktop. Both databases are also saved in the **Work Files for Office 2010** on your disk, which should still be in the disk drive.

Close the **Access** database, then go to **Start > My Computer**

Locate and **open** the **Work Files for Office 2010** folder, **double click** to open the **Data Files** folder, then **double click** to open the **Databases** folder

Now, if you would like to make a backup copy of your database, go ahead and copy each of the files in the **Databases** folder onto another disk or back them up by sending them to yourself in email, then shut down your computer

It is always advisable to make backup copies of all the documents that you create.

## LOOKING BACK

You have learned how to build an *Access* database. The concepts that have been covered in this tutorial apply in general to all computer-based databases. You have to plan first. Then you have to define, or set up, the database, telling the system what fields you need in each record. This done, you enter the data for each record and save everything on the disk.

You practiced scanning the database in multiple (Datasheet or columnar) or single (Form) record layout. You also learned how to clear records and change entries.

## LOOKING FORWARD

There is a great deal more to learn about the *Access* database, especially with regard to searching for specific sets of data, sorting (arranging) data, and producing various types of reports. Lesson 7 will provide you with the opportunity to practice these skills. In the meantime, in Lesson 7 you will learn how to do Mail Merge. This is an especially useful skill for teachers, since you will often want to “mass mail” correspondence to the parents of your students. Mail merge is also useful for other types of projects, such as forms of various kinds which need to be tailored for individual needs. Mail merge involves the use of the *Access* database, too; so now that you are familiar with *Access 2010*, you are ready to tackle Mail merge.

## SKILL CONSOLIDATION

Complete these exercises to reinforce what you have learned in Lesson 6.

1. Design and create a database for the names, addresses, and telephone numbers you have in your address book. Enter as many names and addresses as you like (as long as you have at least 6). Don't forget to save the database records as you go along.
2. Add a couple of records to the database you created in exercise 1. Clear a record.
3. Add a field to the address book database—say Association (how are the people associated to you—friend, colleague, etc.). Then enter the data for each record for the new field.
4. Imagine you are teaching a class and you want your students to do research on a topic. Design and create a database around that topic. You could discuss the fields with your students. The students would then go off, do the research, and enter the data into the database as a basis for a paper they must prepare. This would be a nice group (team) exercise.
5. Design and create a database for a Birthday List of your family and friends. Include fields such as Name, Birthday, Greek sign, Favorite color, Clothes sizes, Hobby, etc. Have at least 6 records in the database, with each record containing at least 5 fields. Create a Form for the database as well as a Table.

6. Open the *Access* database Fall Roster 2010 and enter a complete new record for a student named Jane Doe.
7. Open the *Access* database named Template. Change the name to Grade X.2010 so you won't lose the template, and add three (3) records. Then save the updated database.