7 INTRODUCTION TO THE *ACCESS* DATABASE
Keeping student records

LEARNING OUTCOMES

In this tutorial you will learn about databases in general and about the *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!

7.1 AN OVERVIEW OF THE DATABASE CONCEPT

The database component of Microsoft *Office 2003* is designed to act as an "intelligent"[1] electronic 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;

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

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[1] 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.

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. The database objects that you can create using *Access* are illustrated in Fig. 7.1.
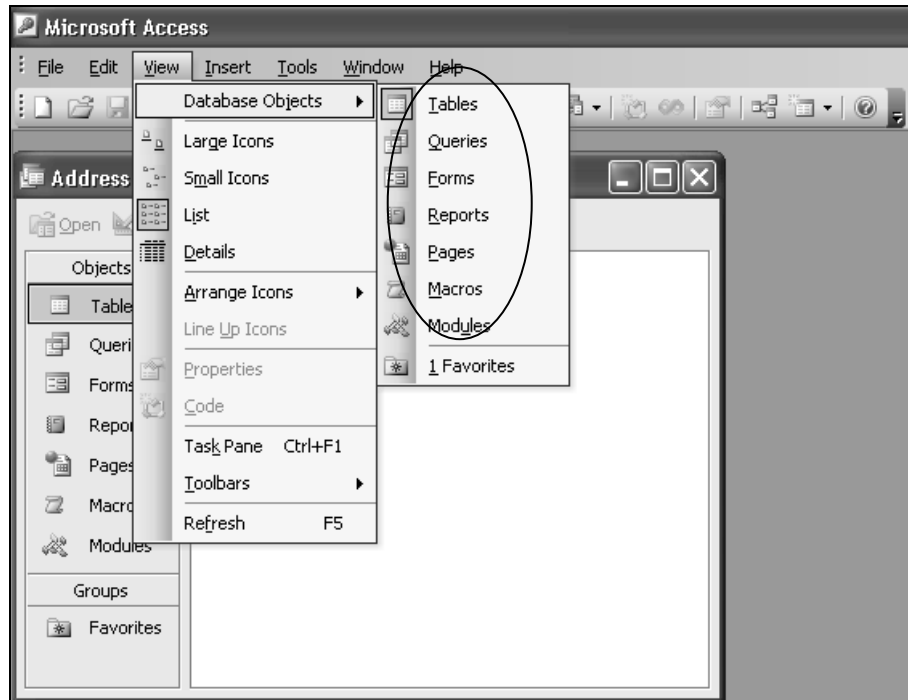

Fig. 7.1 The *Access* database objects

- A **Table** uses rows and columns to present the data in the database—rather like a spreadsheet. For this reason, when you view 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.

- A **Query** makes a request to the database, asking it to find for you some data that are stored in the database. You will learn about queries in Lesson 8.

- 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. You will learn about Forms in this lesson, too.

- A **Report** is used to present a selected set of contents from the database in a format that is easy to mentally digest. You will learn about reports in Lesson 8, too.

- A **Page** is a special type of web page designed for viewing and working with data from the Internet. This *Access* feature is beyond the scope of these tutorials.

- A **Macro** is a sequence of instructions which can be carried out with a single click of the mouse on a button in a toolbar or by pressing a key or combination of keys on the keyboard. You may recall developing a *Word* macro in Lesson 6.

- A **Module** is a collection of programming procedures designed to give database programmers control over how the *Access* database "looks and feels". This *Access* feature, too, is beyond the scope of these tutorials.

The general terminology used to describe data storage
Words are our stepping stones to knowledge. Personal computers today still use disks 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;
- Database documents organize the data (of all kinds) into records and fields.

Access **database terminology**
An *Access* database is able to contain thousands of records. Records contain fields. Each field contains entries made up of text, 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 field names (*Access* database field names may be up to 63 characters long) such as Common Name of bird, type (Family) of bird, Size, Habitat, etc. A field name such as Common Name of bird might contain the entry "seagull", for example.

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 the year, for example, the student would be able to write a relatively sophisticated report using the word processor, merge into the report the data collected in the database, and even add illustrations of the birds.

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 2003 Tutorials** disk in the disk drive, then open *Access* (**Start** > **All Programs** > **Microsoft Office**)

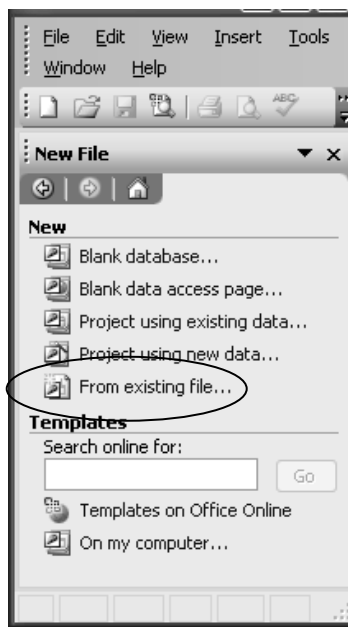In the **New File Task Pane** (Fig. 7.2) click on **From existing file…**

Fig. 7.2 The New File Task Pane

Access will display the **Open** dialog box.

> Make sure the **Work Files for Office 2003 Tutorials** disk is selected, open the **Access Files** folder

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

Showing the Full Menus and organizing the Toolbars

Recall from the previous lessons that when using any of the *Office* programs, it is best to be able to see the full menus at all times. Unless you set the Customize options to show the full menus, you will only see a few of the items in each menu at the top of the *Word* window. So let's start out by setting the Option in *Word* to "Always show full menus."

> In the **Tools** menu, select **Customize…**, then in the dialog box that pops up, select the **Options** tab (Fig. 7.3)
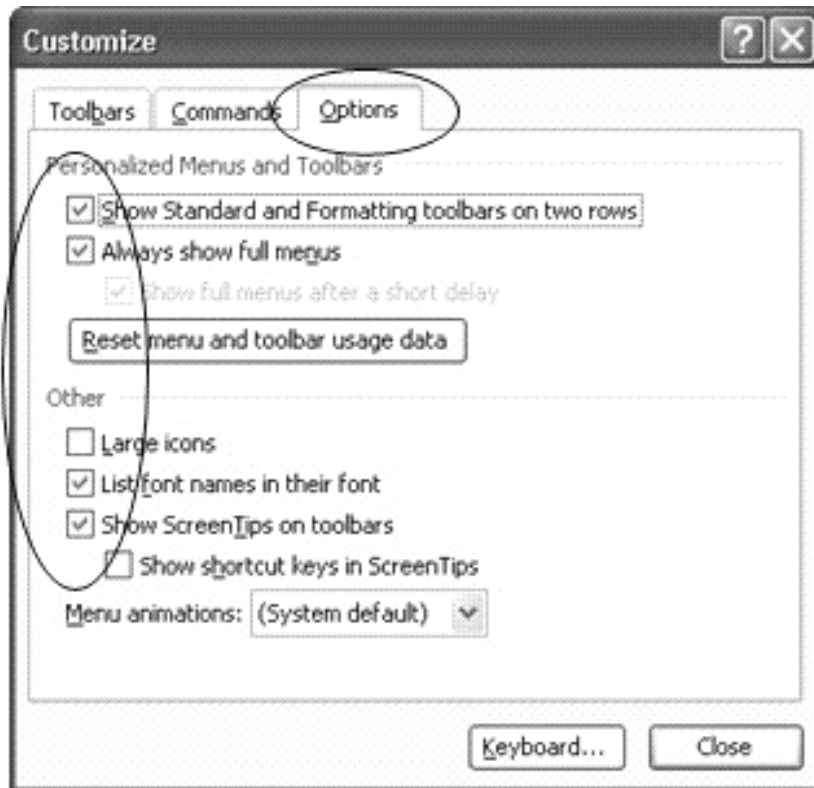

Fig. 7.3 The Customize dialog box

> Make sure there is a **check mark** next to the item to **Always show full menus**

> While you're at it, check the box next to **Show Standard and Formatting toolbars on two rows**, **List font names in their font**, and **Show ScreenTips on toolbars**

> Click the **Close** button when you're ready

On with the tutorial…
Access displays a dialog box (Fig. 7.4) asking you to decide how you want to view the database data on the screen.
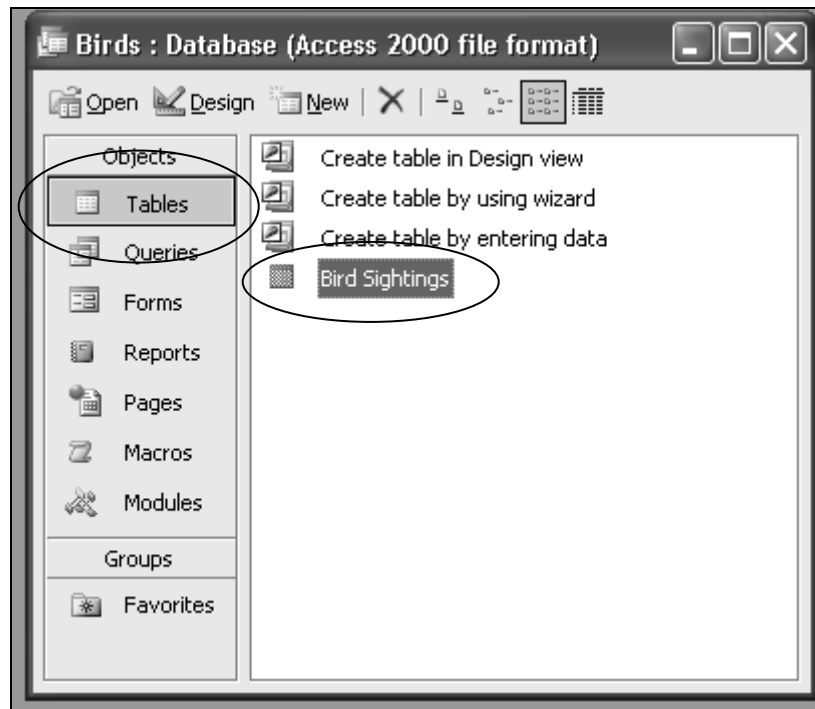

Fig. 7.4 How do you want to view the data in the database?

Each of the Objects listed in the menu on the left side of the database dialog box (Fig. 7.4) represent one of the possible ways to view the data in the *Birds* database.

You can view the data as a *form*, record by record, as illustrated in Fig. 7.5.

Fig. 7.5 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. 7.6).

	Common Name	Family	Size	
	Purple Martin	Swallow	medium	b
	Redhead	Duck	large	r
	Northern shoveler	Duck	large	g
	Black-crowned Night Heron	Heron	very large	b
	Barn Swallow	Swallow	small	b
	American Bittern	Heron	very large	b
	Ring-necked Duck	Duck	large	b

Record: |◄| |◄| | 16 | |►| |►I| |►*| of 50 |◄| |►|

Fig. 7.6 Records listed in Table View

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

> Make sure that the **Tables** object is selected in the **Birds Database** dialog box and that the **Bird Sightings** table is highlighted (see Fig. 7.4 on the previous page)

> Click on the **Open** button in the **Birds database toolbar** (or just **double click** on **Bird Sightings**)

In the top left corner of the window, in the Title bar, you see the Table name (Bird Sightings). In the bottom left corner of the Form and Table View windows are tools to access specific records in the database. Fig. 7.7 illustrates what each of these navigation tools does.
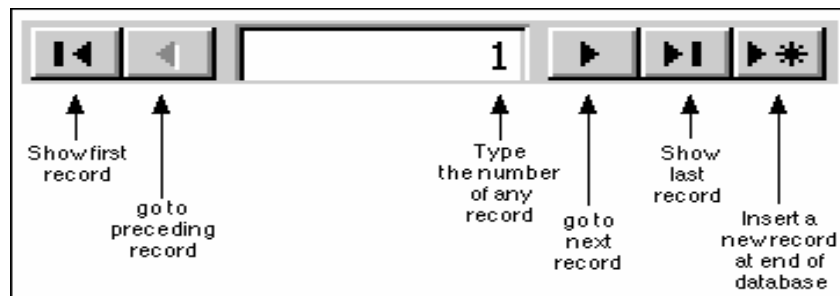

Fig. 7.7 Navigation tools in the *Access* database

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 access control 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. 7.7).

> Try this now to select record **12**

In the Edit menu you can select *Go To* and go to either the First, Last, Next, or Previous record, or you can opt to create a new record.

> Try this now

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.

> In the **File** menu select **Close** to close the **Birds** database, then in the **File** menu select **Exit** to close **Access**

It will be good for you to start from scratch for the next database exercise.

7.2 PLANNING A NEW DATABASE

Before you develop a new *Access* database, you need to have in the disk drive a disk on which you are going to save the database. You may be using a CD or DVD disc, or a zip disk, or even a floppy disk for these tutorials. Whichever is the case, make sure the disk you want to save your database on is in the disk drive now.

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 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 this privacy arena.

- You have drawn up a list of fields (illustrated later in Table 7.1) 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.

7.3 SOME HINTS BEFORE CREATING THE DATABASE TEMPLATE

You are going to start a new document for a database of Student Records. You want to save all your personal documents in your own Data Files folder (not in the Work Files folder).

> Open **Access** (**Start > All Programs > Microsoft Office > Access**) and from the **File** menu select **New...**

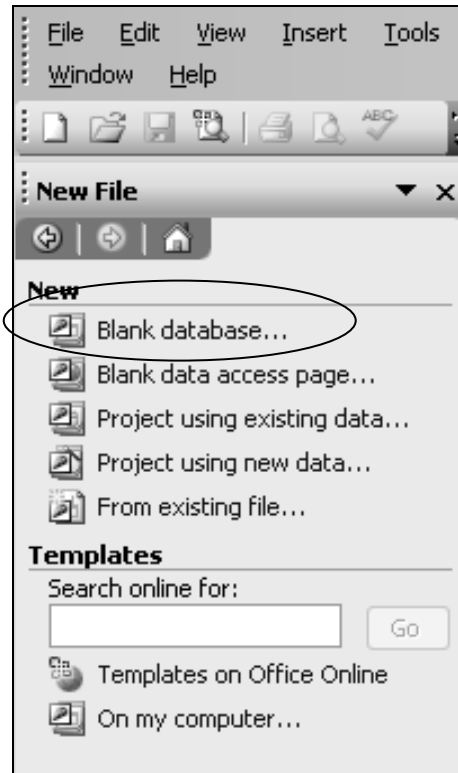*Access* now presents you with the New File Task Pane (Fig. 7.8).

Fig. 7.8 New File Task Pane

> In the Task Pane, click on **Blank Database** (Fig. 7.8) to open a new database, then in the **File New Database** dialog box make sure the **Work Files for Office 2003 Tutorials** is the active disk
>
> Double click to open the **Data Files** folder

You need to create a new folder for the databases you are going to build. You'll maybe recall doing this in earlier lessons when you created a folder for word processed documents and then another for spreadsheets.

> Click on the **New Folder** icon in the **File New Database** dialog box (Fig. 7.9) and name the new folder **Database Documents**, then click on **OK**
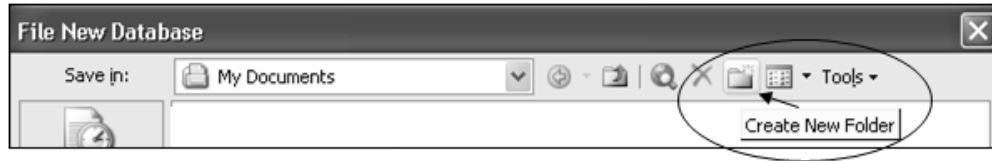
Fig. 7.9 Creating a new folder for your databases

Now type **Template** for the new database name and click on **Create**

The system knows that this is a new document. This is why you are prompted to begin by creating a new Table for the database.

Notice that the Table object is selected on the left side of the dialog box. A Table is the default object in a new Access database. If you look towards the top of the dialog box, you can see buttons for *Open*, *Design*, and *New* (Fig. 7.10).
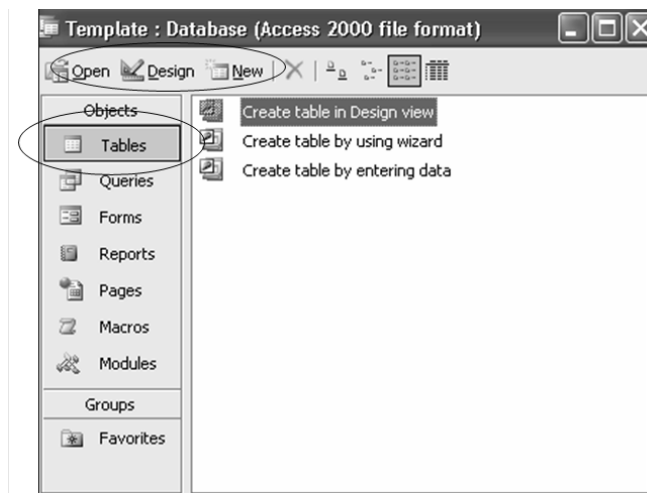

Fig. 7.10 Object control buttons

Click on the **New** button to create a **new Table** in the **Template** database

Access now displays the New Table dialog box asking you to decide how you want to build the database table (Fig. 7.11).
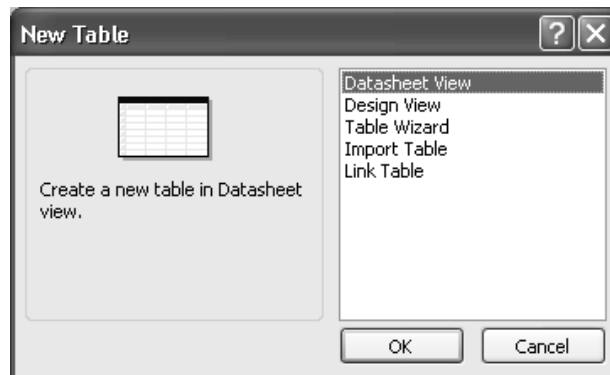

Fig. 7.11 New Table dialog box

If you select the *Datasheet View* you will be presented with an empty list of 30 rows and 20 columns as a basis for you to design your new layout. If you select *Design View*, on the other

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hand, you can go ahead and enter all the fields for the database and specify the data types at the same time. This is what you are going to do in order to learn about data types and data formats while you build the database.

> Select **Design View** in the **New Table** dialog box and click on **OK**

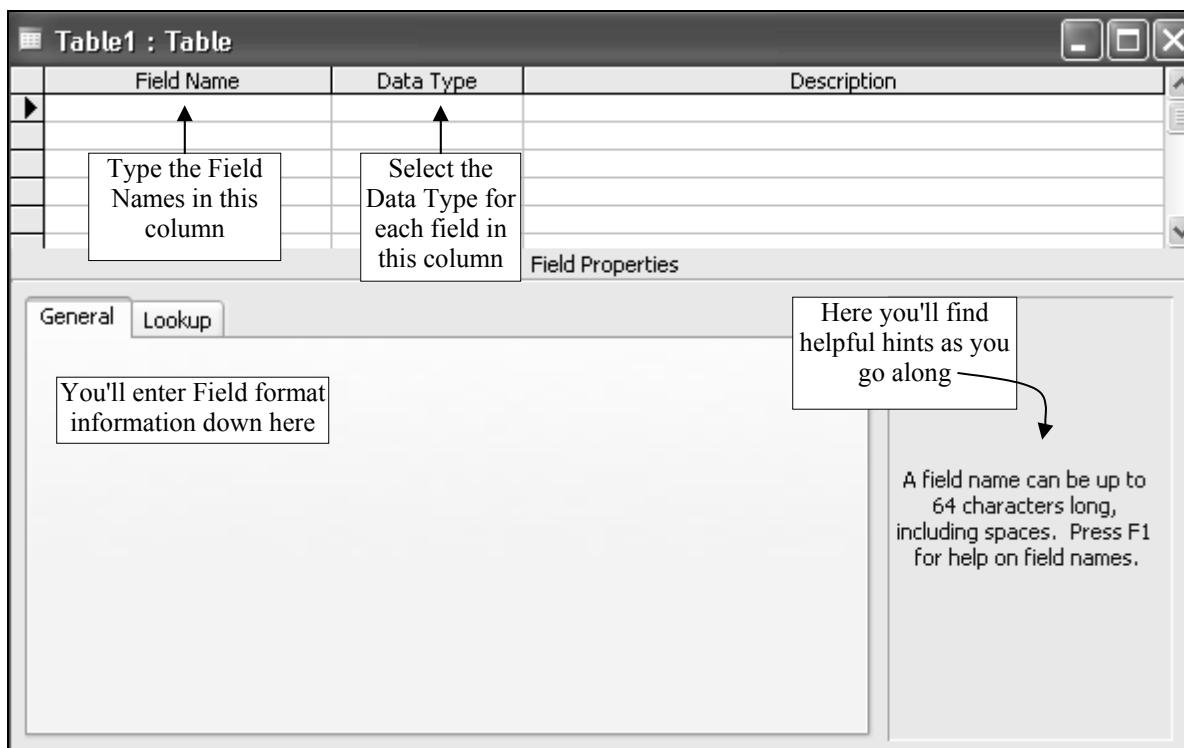You will now see the Table's Design View dialog box (Fig. 7.12).

Fig. 7.12 The Table Design View dialog box

Entering the field names for the new database
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. Before you enter the field names, however, read what follows.

Editing field names You can change the field names after you have committed yourself to them. You also can easily add or delete fields. So, at this stage, do not worry about making mistakes. For example, if you start typing in a name and realize you have made a mistake before you go on, just use the Backspace key to back up and try again.

Selecting the data type of a field As illustrated in Fig. 7.12 above, after typing in the field name in the first column, decide what the field's data type should be in the second column.

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.

7.4 CREATING THE DATABASE TEMPLATE

Entering field names for the database

Table 7.1 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 <u>first column</u> of Table 7.1. The second column tell you what Data Type to choose. The other columns in the table below (Required, Length and Comments columns) simply explain whether data is to be "Required" for that field from the user and what size (in text characters) the field is allowed to be, along with tips on what to do.

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 7.1 Template Field Name listing

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

Notice, in the <u>lower right</u> 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 <u>lower left</u> section of the window you can see the *Field Properties* dialog box (Fig. 7.13 on the next page).

In Table 7.1 above, the *Length* column specifies the number of characters required for several of the fields in your database.

> Check this now so you know the **correct size** for each field

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

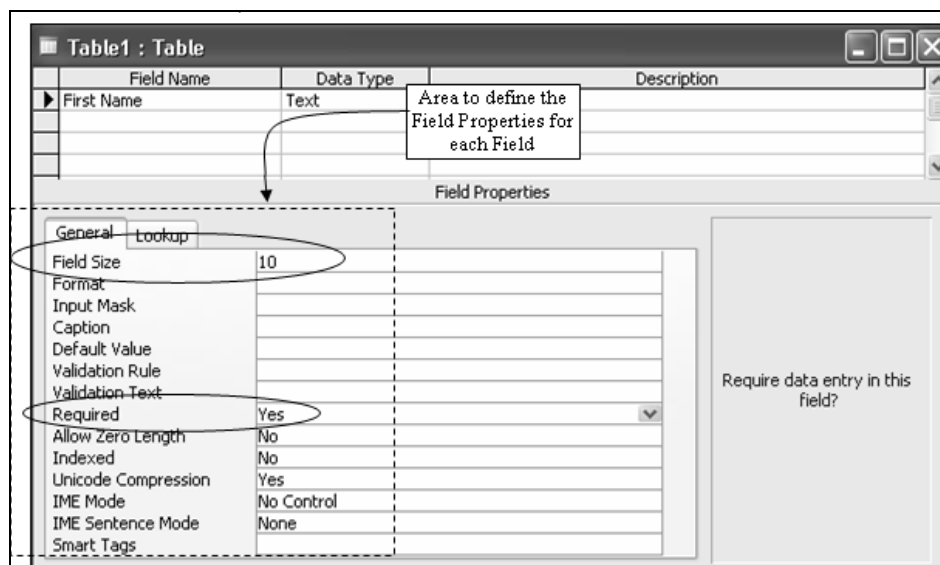> In the **Field Size** box type **10** (to allow up to 10 characters for the field)

Fig. 7.13 The Field Properties dialog box

For the First Name field, and for several other fields (again check out Table 7.1) 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, **double click** in the data entry box next to **Required** (Fig. 7.13) 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 **First Name** so you can enter more database fields

Enter the field names **Middle Name** (**10** characters), **Last Name** (**15** characters), **Home Contact** (20 characters), 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

Checking or entering data automatically
Using the Lookup Wizard to specify selected values for a field
For the database fields such as the Gender, City, and State (see Table 7.1 on page 210), 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 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.

Enter the field name **Gender** in the next **Field Name** box and hit **Tab**

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. 7.14) click on the radio button next to "I will type in the values that I want", then click on **Next >**
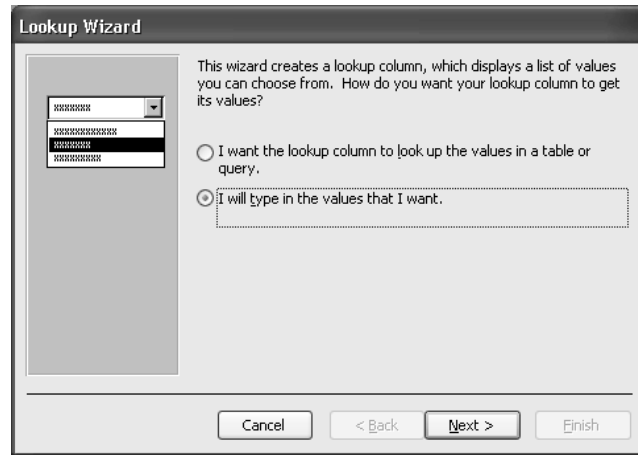

Fig. 7.14 Opting to enter the values yourself

In the next Lookup Wizard dialog box (Fig. 7.15), leave the default **1** for the **number of columns**, hit **Tab** (or click in the data entry box under **Col1**) and type **M** (for Male)
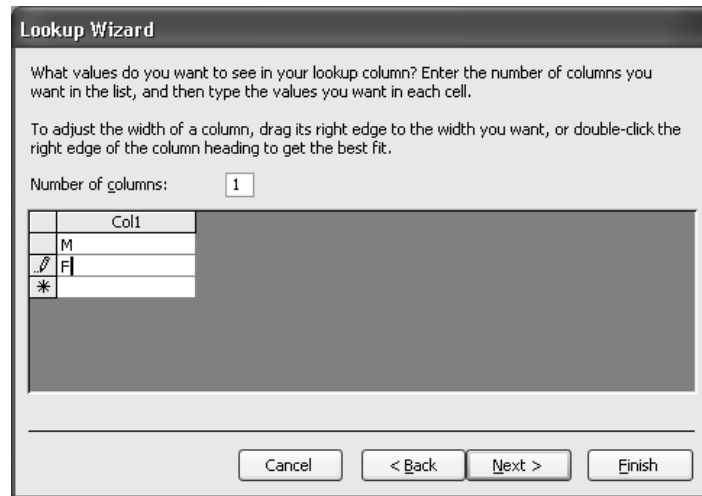

Fig. 7.15 Entering the values for the Gender field

Hit **Tab** or click in the next data entry box in the **Col1** 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 and click in the data entry box under **Gender**, type the field name **Address Line 1**, hit **Tab**, leave the **Field Size** as the default of **50** and make it a **Required** field

You should 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

> 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

Certain fields always have the same format, like zip codes or phone numbers. 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 to some degree 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 7.1 on page 210).

> 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, you should 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 window, in the **Field Properties area** of the dialog box, click in the **Input Mask** data entry line (Fig. 7.16)
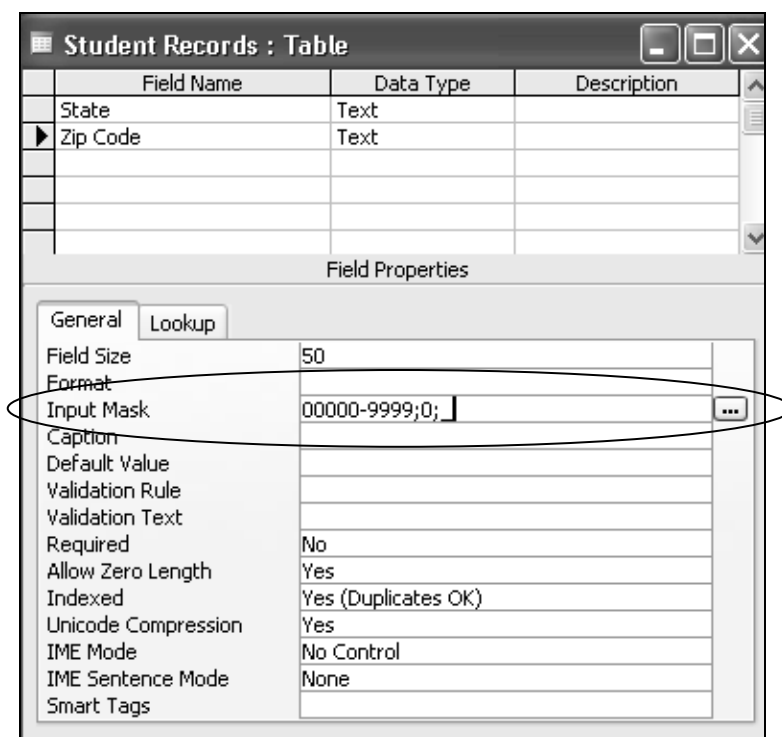

Fig. 7.16 Using an Input Mask

Now click on the **ellipses (...)** that pop up at the **right** of the data entry box (see again Fig. 7.16)

When *Access* prompts you to do so, click **Yes** to **Save the Table**, name the table **Student Records**, then click on **OK**

Now you are asked to define a Primary Key for the Table.

Primary key or no primary key? that is the question!
If you were designing the database for an administration application in the Principal's or Superintendent's office, this would be an important consideration, because your database would be large, and there would be many ways of looking at the database (called "views" on the data) represented by different tables. The purpose of a primary key is to allow for easy manipulation of the data across multiple tables. This is not something the class teacher needs to worry about, so you won't need a Primary Key for the table.

Click on **No** to tell *Access* you don't want a Primary Key field in the database

Now click on the **Zip Code input mask** in the **Input Mask Wizard** dialog box (Fig. 7.17)
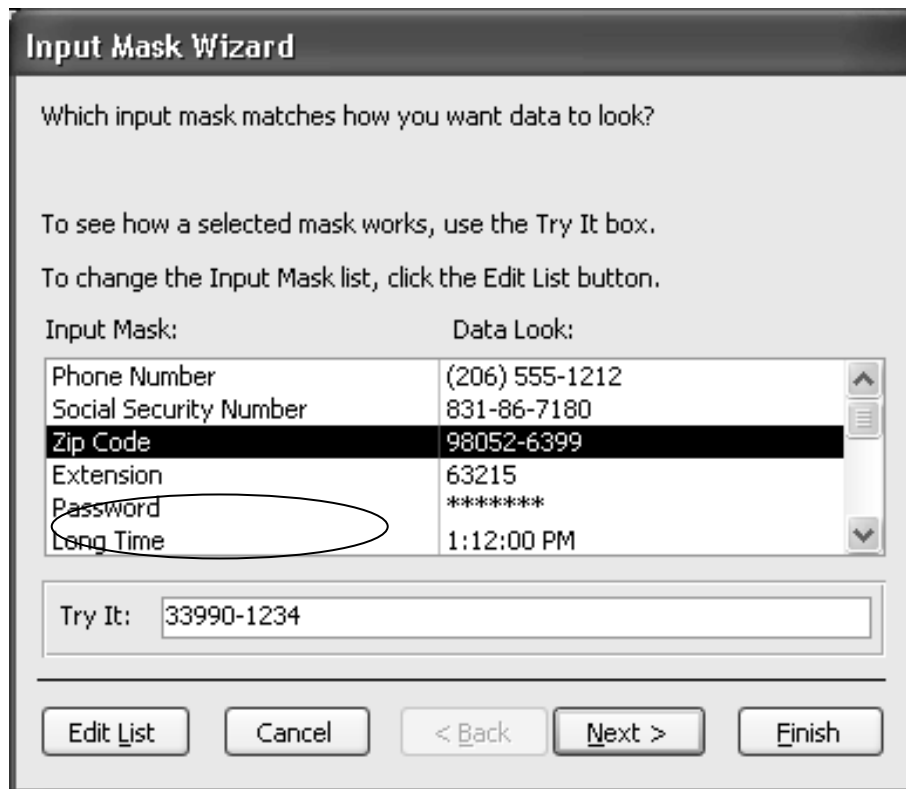

Fig. 7.17 Zip Code input mask

Click on **Try it** to see how the mask works—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. 7.18) 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.
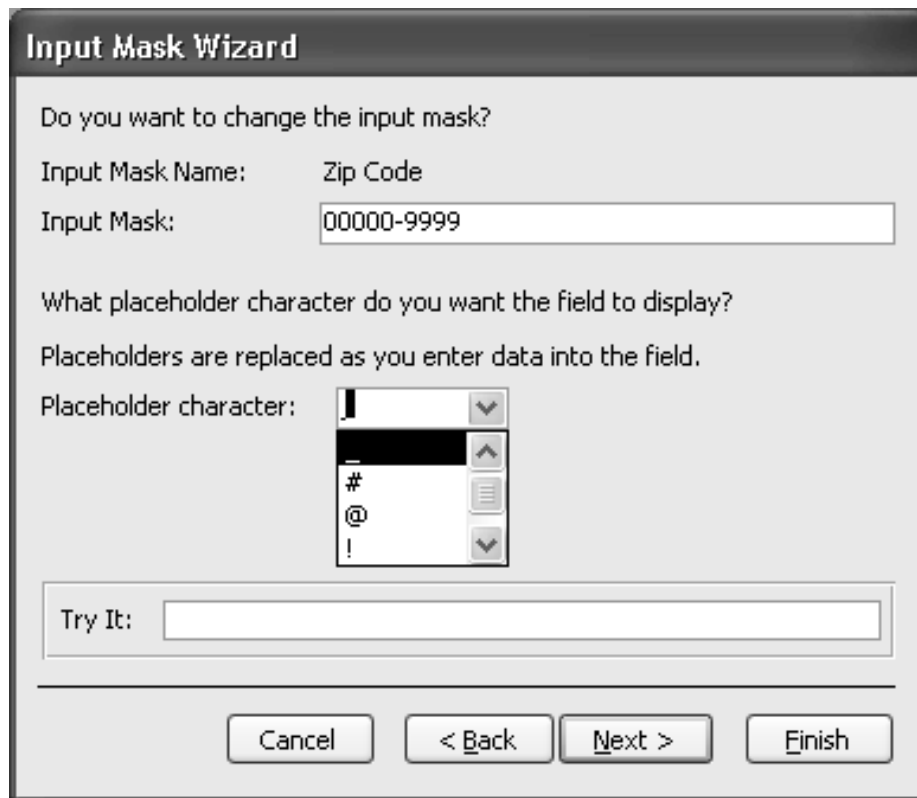

Fig. 7.18 Option to change Zip Code input mask

> The **underline** character is the default, as you can see, so select 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:**, then click on **Finish**

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 (Fig. 7.17 on page 214) 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 7.1 on page 210, you want to select *Short Date* as the data type for the field, and apply an input mask to the data 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** click on **Close** in the **Window control menu** (the little grid-like icon next to **Student Records** in the top left corner of the Design View window)

> Click on **Yes** to tell *Access* to save the changes you have made to the Student Records Table

You are now back to the top level dialog box for the Template database. You have defined the database Table which will allow you to start entering the data for a class of students.

7.5 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. This makes a form a convenient tool for data entry purposes because it allows the user to see all the entries in a single record at one time, unlike the Table view (the Datasheet View) which will often be unable to show all the columns of data across the screen.

> On the **left hand side** of the **Template** dialog box, click on the **Forms** object button

You now have a choice of creating the new form in Design View, which means you'll have to do all the work yourself, or you can use the Form Wizard, which is a lot easier.

> Double click on **Create Form by using Wizard** to bring up the **Form Wizard** dialog box

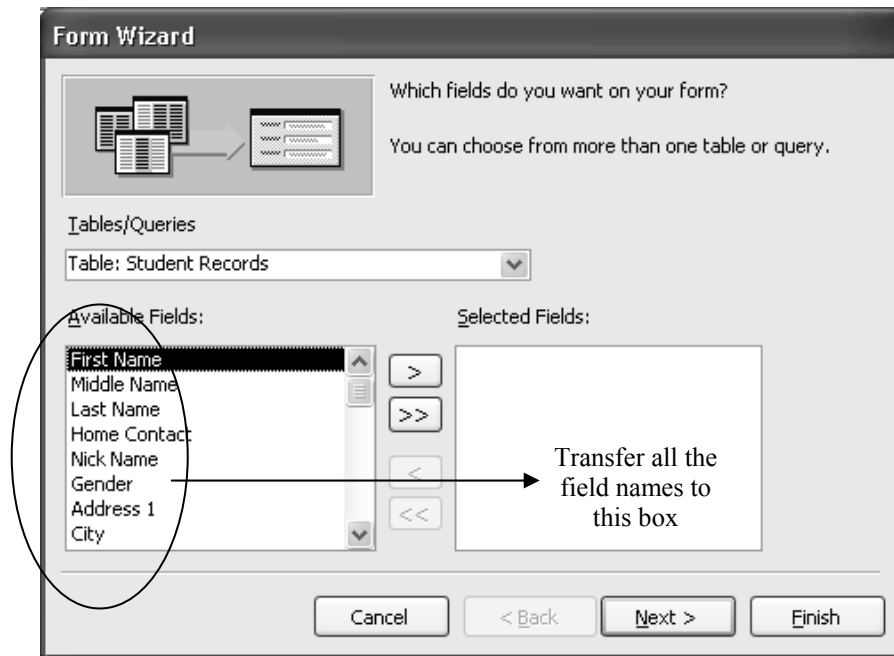The Form Wizard (Fig. 7.19) is displayed on the screen.

Fig. 7.19 The Form Wizard dialog box

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.

> **Double click** on each field one by one in the **Available Fields:** list in order to transfer all **19** of them across to the **Selected Fields:** scroll box

> Once you have selected **all 19 fields** (there should be none left in the left hand side of the dialog box), click on **Next >**

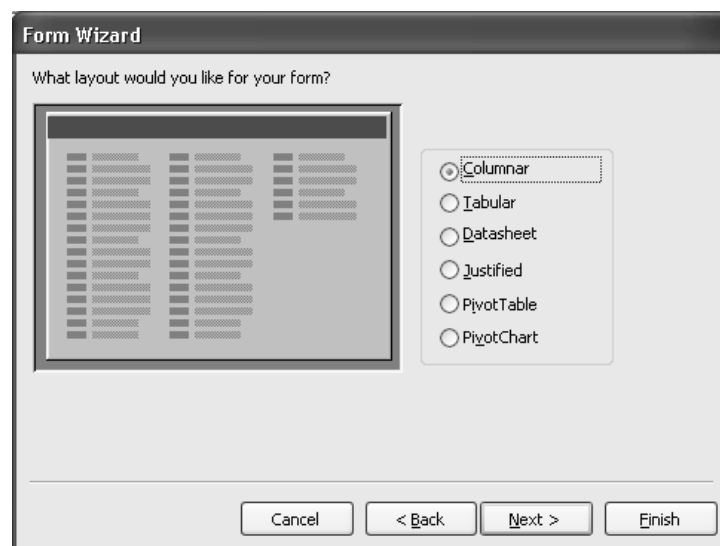The Form Wizard now asks what layout you want for the new Form (Fig. 7.20).

Fig. 7.20 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

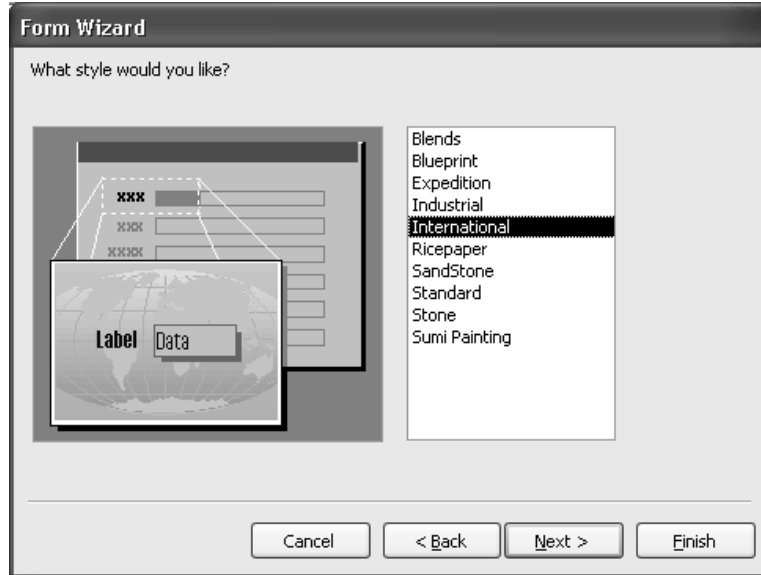Now the Form Wizard asks you to choose a style or look for the Form (Fig. 7.21).

Fig. 7.21 The Form Wizard style options dialog box

Click on each of the styles so you can see what options you have, but for this exercise make sure you end up with the **International** style selected, then click on **Next >** again

In the next dialog box (Fig. 7.22), the Wizard asks you to name the new Form (*Student Record* will do fine—note that the name is singular since you'll be using the form to view one record at a time) and also whether you want to modify the design in any way.
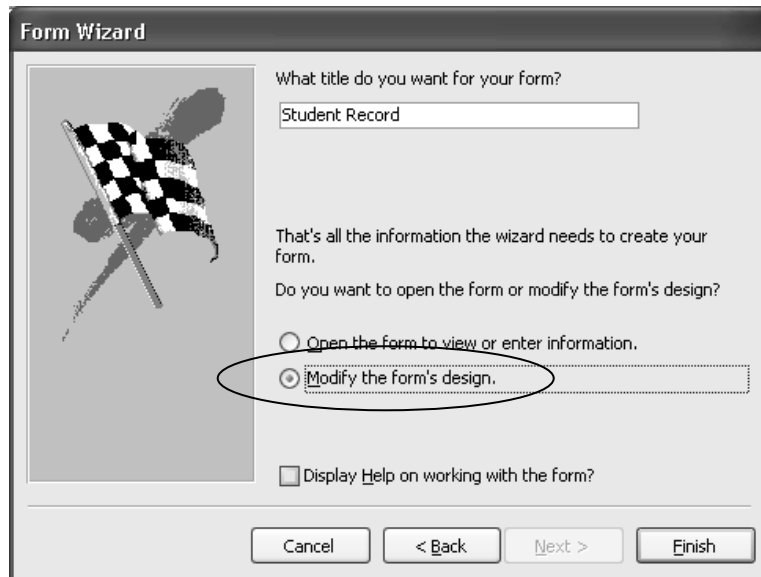

Fig. 7.22 Option to name and modify the form

> Make sure the radio button next to **Modify the form's design.** is selected,
> then click on **Finish**

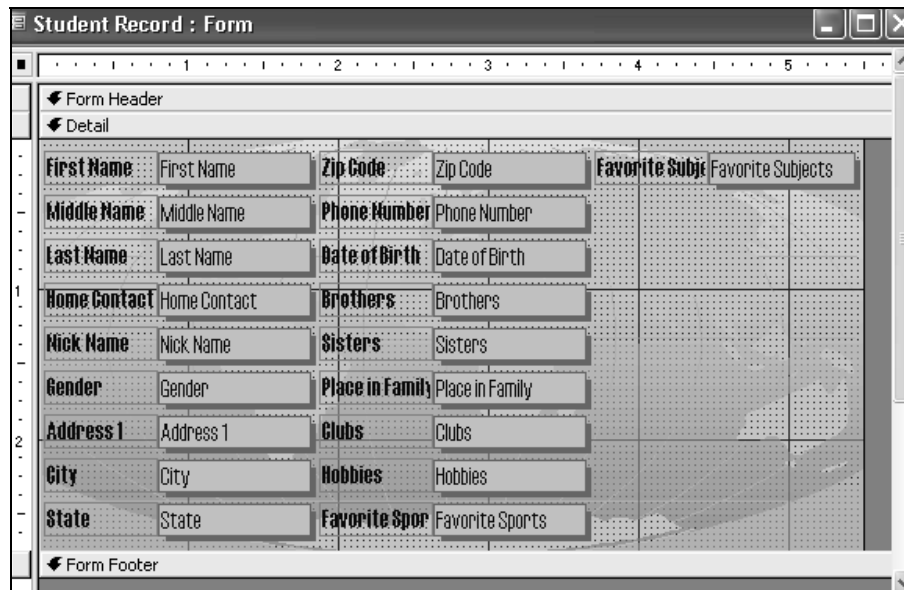*Access* now displays the Wizard's default layout for the Form (Fig. 7.23).

Fig. 7.23 The new form in the Design View

> If necessary, either **move** or **close** the floating **Form Design Toolbox** so that
> it is not on top of your Form

You are now going to rearrange the layout of the form. Fig. 7.24 shows the Form after you have rearranged the field names and data entry boxes.
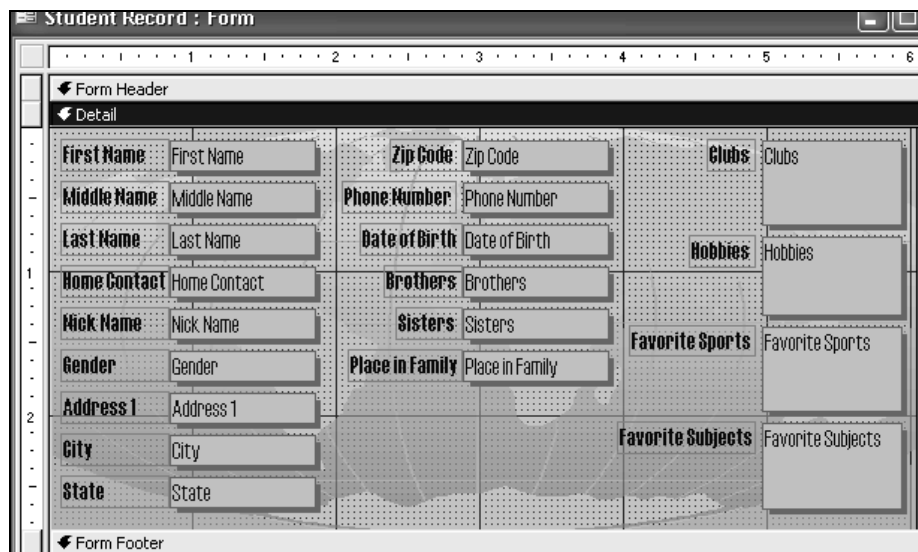
Fig. 7.24 The new database Form *after* rearrangement of field names and data entry boxes

Rearranging the layout of a record in the Form window

You need to make a few adjustments to the basic Form so that there is enough room for the field names where they are too long to fit in the space allowed by the Form Wizard. You also need to reposition some of the fields to make it easier for the user to enter data into the various data entry

boxes. In the exercise that follows, use the dots in the grid to help you align the data entry boxes for each field in the form.

First you may need to increase the size of the form as a whole.

> If necessary, click on the **Maximize** button to make the *Access* window the same size as the whole screen, then do the same for the **Student Record form** window

> Now position the mouse pointer on the **right edge** of the form window so you see the **crosshair**, then hold down the **left** mouse button and **stretch** the form **to the right** an inch or so

Let's start with the Favorite Subjects field. Fig. 7.24 on the previous page illustrates how the Favorite Subjects data box will look in relation to the other data boxes in the form when you're done adjusting its size.

> First click on the **Favorite Subjects** data box to get the handles around it

> Now grab the handle at the **bottom center** of the box and drag **down** to make the box a little over twice the size (you don't need to be too precise about this)

> Now position the mouse arrow along the **lower edge** of the box (but <u>not</u> on one of the handles) till it changes into a **small black hand**, then hold down the mouse button and drag the **Favorite Subjects** box, along with its **Field Name**, down towards the **lower right corner** of the Form, and tuck it there, as illustrated in Fig. 7.24

This is awkward at first, but you'll get used to it. Now you need to adjust the size of the name of the field so that you can read all the text *Favorite Subjects*.

> Do the same to the **Favorite Sports**, **Hobbies**, and **Clubs** data entry boxes, **re-sizing** them so they're more or less the same size as the **Favorite Subjects** box, then moving them **down and to the right**

If you did the job correctly, your Memo data entry boxes should look like Fig. 7.25.

Fig. 7.25 The lined up Memo data entry boxes

> Now click on the **blue** Field Name **Favorite Subjects** (you can only see "Favorite S"), grab the handle **on the left center** and drag the edge of the box to the **left** so it becomes wide enough to show the whole field name

> Now that you know what you are doing, **readjust** and **rearrange** all the remaining field names and data entry boxes until your Form looks like that illustrated in Fig. 7.24 on page 219

> When you have completed the rearrangement of the Form, click in the **Close** box for the window, then click on **Yes** when prompted to save the changes to the **Student Record** form

> Now double click on **Student Record** in the **Template Database** dialog box to open it up as a **data entry form**

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. 7.24 above. You can now go ahead and start adding records to the new database.

7.6 ADDING RECORDS TO A NEW OR EXISTING DATABASE

Creating a new database based on the Template database (Importing Objects)

The *Access* database Template is so named because you want to use this same template document (with its table *Table1*) and data entry form (*Form1*) 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 based on this template document. You will use the new document to store actual student data. The template will remain unchanged for future use.

How you name documents is important. For the sake of this exercise, you're going to call the new database Roster 2004. The name indicates that the document will contain the database of student records for a year 2000 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 for Roster 2004 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.

> From the **File** menu select **New...** and, in the **New File Task Pane**, click on **Blank Database**

> In the **File New Database** dialog box that pops up, make sure your **Work Files for Office 2003 Tutorials** disk is the active disk

> Open the **Data Files** folder then open the **Database Documents** folder

> Type the new document name **Roster 2004**

Importing a Table

You are going to start by importing the table called Student Records from the Template database. This will save you having to recreate the table all over again for the new class of students you're doing to put in the Roster 2004 database. This is where all that work on the Template comes in

handy. You'll be able to use the Template over and over again for new classes in ensuing semesters or years.

> Click on the **Tables Object** button on the left hand side of the dialog box
>
> From the **File** menu, select **Get External Data** > **Import...**
>
> In the **Import** dialog box, locate and double click on the **Template.mdb** database

A new dialog box (Import Objects) asks you to specify which table(s) you want to import from the Template.mdb database (Fig. 7.26).

Fig. 7.26 Importing an external database Table Object

You are asked to confirm that you want to import the *Student Records* object to the Roster 2004 database.

> **Student Records** is the only table in the database, so click on **Select All** and click on **OK**

Importing a Form
Here are the steps to import the form Student Record from the Template database.

> Click on the **Forms** button in the **Roster 2004** database dialog box, then, from the **File** menu, select **Get External Data** > **Import...**
>
> In the **Import** dialog box, double click on **Template.mdb**, then click on **Student Record** in the **Import Objects** window and click on **OK**

The Roster 2004 database now has a Table and a Form identical to the table and form that you created for the 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 **Roster 2004** database open, so click on the **Forms** button in the **Roster 2004** database dialog box, then **double click** on **Student Record** to open it

Remember that each record in the Roster 2004 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 all 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 (four or 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 Roster 2004 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 8.

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.

7.7 VIEWING THE DATA IN THE DATABASE

At this time, you should learn 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 **preceding** *record*, click on the left or right arrows in the **Navigation tools** at the bottom of the Form window (Fig. 7.27)
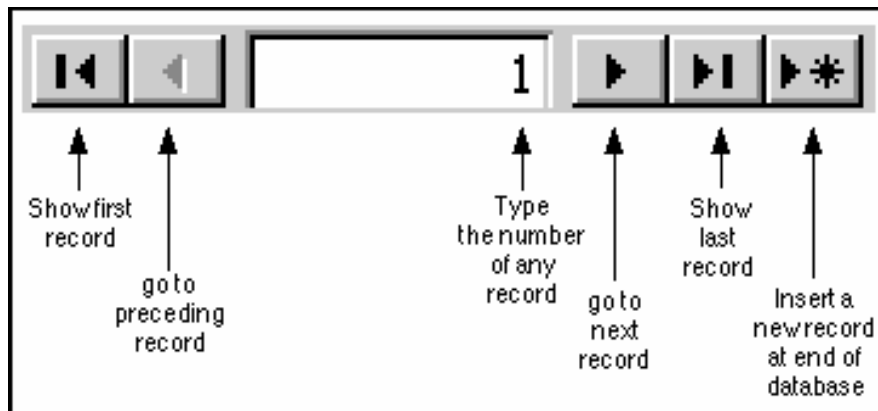

Fig. 7.27 The *Access* database navigation tools

To move quickly through the database as a whole, it's easiest to use the *Datasheet* (Table) *view*.

In the **View** menu select **Datasheet View** (Fig. 7.28) now to see how you can view all the records in one window
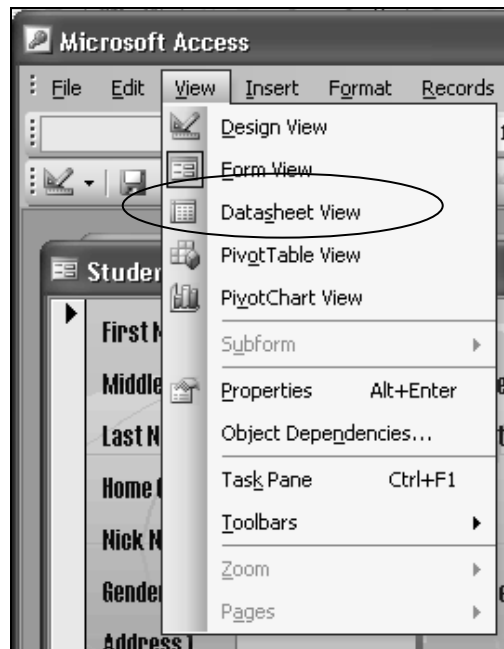

Fig. 7.28 Datasheet View in the View menu

Scroll up and down and from left to right to get a feel for how to check out the records (rows) and fields (columns) of data that make up the database of student records.

In Lesson 8 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.

7.8 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)

> From the **View** menu, select **Database Objects** > **Forms** then **double click** on **Student Record**

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 select Delete Record from the Edit menu, and voilà!

> Try this for practice.

> Click on the **second record** in the **Roster 2004** database to select it

> From the **Edit** 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 must do in this case, because *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 from the **View** menu select **Datasheet View**

> Now drag in the **left hand margin** of the Table to **highlight** as many **adjacent records** as you want to delete

> From the **Edit** 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

And you would go ahead and delete the records or not depending on what you want to do. Notice that the Delete Record command completely removes a record, such that it is irretrievable.

7.9 SAVING A BACKUP COPY OF YOUR WORK

Your last task before completing this session at the computer is to make a backup of your Template and Roster 2004 databases on another disk. The Roster 2004 database is still on the Desktop. Both databases are also saved on your **Work Files for Office 2003 Tutorials** disk, which is in the disk drive.

> Start by closing the **Access** database, then go to **Start > My Computer**
>
> Open the **Work Files for Office 2003 Tutorials** disk, double click to open the **Data Files** folder, then double click to open the **Database Documents** folder
>
> Drag each of the files in the **Database Documents** folder onto the **desktop**
>
> Take out your **Work Files for Office 2003 Tutorials** disk and in its place insert your **Backup Work Files for Office 2003 Tutorials** disk
>
> In **My Computer** open the **Backup** disk, double click to open the **Data Files** folder, then open the **Database Documents** folder
>
> Now drag each of the files from the **desktop** and drop them into the **Database Documents folder** on your **Backup** disk
>
> Wait while the files are being saved, then shut down your computer

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. Finally you learned how to save a copy of a database onto your Data Backup disk.

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.

SKILL CONSOLIDATION

Complete these exercises to reinforce what you have learned in Lesson 7.

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.

6. Open the *Access* database Roster 2004 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.2002 so you won't lose the template, and add three (3) records. Then save the updated database.